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ON

PATHOLOGY AND THERAPEUTICS,

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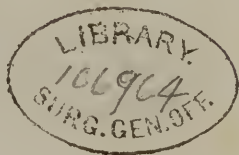
SUBSTANCE OF THE COURSE OF LECTURES

DELIVERED BY

SAM'L HENRY DICKSON, M. D.,

PROFESSOR OF THE INSTITUTES AND PRACTICE OF MEDICINE, IN THE MEDICAL
COLLEGE OF THE STATE OF SOUTH-CAROLINA.

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VOL. I.
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TO N. CHAPMAN, M. D.

PROFESSOR OF THE INSTITUTES AND PRACTICE OF PHYSIC AND CLINICAL PRACTICE
IN THE UNIVERSITY OF PENNSYLVANIA,

IN TESTIMONY OF THE HIGH REGARD ENTERTAINED FOR HIM BY ONE WHO,
WITH HUNDREDS OF OTHERS, RECEIVED THEIR FIRST AND MOST AGREEABLE
LESSONS IN THE STUDY OF MEDICINE, FROM HIS PUBLIC LECTURES—A SERIES
OF DISCOURSES DISTINGUISHED FOR THEIR INGENUITY, USEFULNESS AND
ELOQUENCE:—

THIS WORK IS RESPECTFULLY DEDICATED,

BY THE AUTHOR.

PREFACE.

It had long been my intention, in compliance with a wish repeatedly expressed by the classes in attendance at the Medical College of the State of South-Carolina, to publish, as soon as I could devote myself to the preparation of such a work, a complete and systematic Treatise on the Practice of Medicine. But, I have now, neither the ambition to attempt the task, nor do I imagine, that the advantage to be attained by its performance, would be, in any degree, commensurate with the sacrifice of time and labor which it would demand. The field is fully occupied, at least for the present; and the student or young practitioner, who has in his hands the volumes of Craigie, Copland, Dunglison, and Mackintosh, can require nothing more of that compendious and extensive character.

Besides this, the real utility and success of a different class of writings, in style and manner less formal and more popular—Elliotson's, Graves', Stokes', Chapman's, and Watson's Lectures, have decided me to give to the press, with little alteration, the substance of the Essays which constitute my College course of instruction.

No one who will read them, can be more fully aware of their imperfections than I am; yet, I will venture to entertain the hope, that they may present some views worthy of consideration, more especially to the Southern student and practitioner, for whom they were originally written, and to whom, they are now, with all due deference, submitted.

CHARLESTON, Dec. 25th, 1844.

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LECTURES

ON

PATHOLOGY AND THERAPEUTICS.

PATHOLOGY.

INTRODUCTION.

It is of great importance, that in entering upon the long series of investigations which are to engage us during our present and future meetings, we should select and pursue a natural and inductive method. The "Institutes and Practice of Medicine" include all that belongs to the origin, history, effects, cure, and prevention of diseases. These subjects must be considered in the order in which they present the most obvious relations. We must pre-suppose an extensive acquaintance with the facts and doctrines of physiology as of necessity preliminary to our present course. Pathology—a knowledge of the condition of the functions of the human body in the states of disease and death, is a theme entirely comparative; involving, and founded upon a knowledge of the condition of the same functions in their natural and healthy state.

It is difficult to define disease with such precise fidelity that no exception shall be taken to the accuracy of our definition; and this difficulty seems to be insurmountable, as inherent in the very nature of the case. The presence of disease always implies some aberration or irregularity in the performance of

one or more of the functions; but such aberration, it must be admitted, is in itself a mere symptom, an effect—resulting from a cause; the effect external and cognizable—the cause internal and occult; and as we know in very few instances, the intimate nature and mode of action of this cause, we can know very little of the indispensable condition upon which disease depends, and which indeed forms an essential part of the meaning of the term; nay, although as I have said above, a cognizable irregularity is so uniformly implied in the state of disease, the doctrine is not without apparent exceptions; as for example when an exposed subject has become infected by contagion or malaria. During the latent period that ensues, as also in the apyrexia of some intermittent fevers, and in the intervals of certain recurrent affections, gout, epilepsy, neuralgia, he seems to enjoy his usual health, without any sensations of discomfort or disturbance of function that can be detected or described; but in this state of inevitable predisposition to some impending malady, it would be absurd indeed to regard him as in a sound or physiological condition of body. As then we always comprise in our consideration of disease not only the aberration of function in which it might at first view be supposed to consist, but also some reference to the source or origin of the disturbance, the first step to the proper understanding of our subject must be an inquiry into the Causes of disease. This will suggest and lead on to a careful observation of the parts upon which these causes act, and whose movements they disorder, and thus we shall find ourselves engaged in the question as to the Seats of diseases. The Phenomena or symptoms which result from the efficient impression of the various causes of disease upon the parts which they affect, will of necessity engage our notice in this connection; and here we shall derive much advantage from the investigations and discoveries of pathological anatomy, a department of our science hitherto too little cultivated in our schools, but now fast attaining its proper standard of estimation. Hence we shall proceed to the consideration of the Effects of disease, or the changes wrought upon the system by its presence, its characteristic influences, or its protraction. Thus we shall learn the modes and circumstances of death, that event which is destined to terminate all organic existence, but which assumes so awful an aspect in its rela-

tion to our moral and intellectual being. Lastly, under the head of therapeutics, which regards properly the cure of diseases only; I prefer to treat incidentally of hygiene, the highly valuable science of prevention—the noblest office as it is the most urgent duty of our profession; because the rules which require to be laid down are comparatively specific and adapted to separate instances rather than of wide or universal application.

Disease it has been said exhibits itself in some aberration or irregularity in the actions or movements of the body. This disturbance may be unconnected, especially in the first instance, with any structural change, any alteration of the anatomical condition of the organ concerned in the performance of the function. By its mere protraction, however, such change seems ultimately to be induced in numerous instances, and then the organic deterioration increases or perpetuates the disorder to which it owes its rise. In other cases certain changes of structure obscurely and gradually take place, which after a time inevitably interfere with the normal performance of the functions of the part affected. Hence the distinction of diseases into functional and organic, and the importance of a close inspection of dead bodies; and hence the value of accurately described autopsies, and extensive and well preserved museums of pathological anatomy.

A farther distinction of disease is recognized into local and general. A single part or organ may be exclusively affected, and the case will then be more or less important in proportion to the more or less direct influence of such organ upon the vital actions of the constitution. General ensues upon local disease when the primary and original affection of a part, has been communicated, whether by nervous sympathies or by radiation of morbid impulse and irritation to other and more remote portions of the system; or when, as perhaps may occur, the whole of the organs, or several of them have been simultaneously impressed by a malignant influence. Each of these conditions, it is evident may occasion the other; general disease being most commonly, if not uniformly, the extension of some local affection, sympathetically or otherwise—as in tetanus, in the phlegmasiæ, etc.; and local derangements being frequent results of the disturbed sensations and actions of particular organs, occurring in the progress of a general or constitutional disease, especially where this

exhibits a tendency to determine to any particular organ, as in intermittent fevers, which by their repeated succussions give rise to enlargements and indurations of the spleen and liver. It may indeed be argued with much plausibility that all diseases are originally local; for so far as we know the agency and adaptation of the causes which produce them, they seem limited in their application, and unlikely to affect in the first instance more than one tissue or structure.

The human frame constituted and organized in the admirable manner, which it is the province of anatomy and physiology to develop and describe, when set in motion by the mysterious force of the vital principle, has an evident tendency to pursue in a definite method the performance of the numerous functions peculiar to the living body. It would continue doubtless, if undisturbed, to fulfil these offices, in this natural way, with undeviating perseverance, until the materials of which it is constructed were worn out, or the organs of supply failed to restore the waste incurred by action; and such indeed is the euthanasia of the poets, and speculative philosophers, so seldom (if ever) met with in fact. The circumstances of our varied states and conditions however, exhibit a perpetual tendency to derange the harmony of its actions and the regularity of their progression. Causes of disease present themselves on every side; they assail us from within as well as from without. The effort to elude them altogether is indeed hopeless; but they can to a certain extent be avoided, if detected and pointed out, and their influences may be much modified and diminished by proper attention. Without a thorough knowledge of their sources, their history, the ordinary modes of their invasion of and action upon the human constitution, the physician, whatever degree of skill he may empirically obtain in the cure of diseases, will of necessity remain unqualified for what I have already designated as the nobler and more beneficent department of his profession, the art of preventing them, and obviating their recurrence.

CHAPTER I.

CAUSES OF DISEASE.

CAUSES of disease are formally distinguished by the books into the remote or proximate, or to substitute other words which may convey some meaning—the *efficient* and *constituent*. The proximate cause is almost universally regarded indeed, as in the words of old Gaubius “*morbis ipse*” the very disease itself; it will therefore be more properly considered when we come to treat of diseases, individually and specifically. Let me observe, however, that the use of terms in this manner is not only vague and uninformative, but that it involves a contradiction and a great absurdity. Can any thing be the cause of itself—in any sense its own cause? We had better at once resort to the ludicrous definition of the doggerel poet, and denote the proximate cause as

“That without which a thing is not—
The *causa sine qua non*.”

Perhaps it would be well to define the proximate cause as the first essential link in the chain of morbid actions, whose results become obvious in the symptoms of disease. This is the constituent condition, upon which depend all the subsequent circumstances that give diseases their characteristic and peculiar form. Our acknowledged ignorance on this very obscure subject, ought to teach us much caution in the promulgation of what are called “Theories of Disease.”

Remote causes are more within the reach of our investigations, and have received from the earliest times, as they deserve, a large share of the attention of pathologists. They are variously divided and subdivided, as to their nature and modes of action. Some of them are specifically hostile to the constitution, unfriendly to health, and exert of themselves a morbid and malignant influence upon the organism, or some of the structures of which it is composed. Others again are only incidentally injurious,—as by excess, or by alternations of action too hasty for the powers of accommodation, or too strongly contrasted for the habitual conditions of the recipient tissues.

They are farther divided in reference to their modes of action, into the predisposing and exciting—a distinction which although artificial and by no means uniformly preserved, may be recognized with advantage and utility. The terms are happily chosen as significant in a good degree of their actual purport. Few human constitutions are so perfectly formed or arranged as not to betray on occasion, evident tendency to certain modes of irregular and morbid action. Such tendency or predisposition may be dependent upon, and produced and modified by circumstances both internal and external to the subject: these circumstances may have acted with efficient influence even before birth and during the conformation and contraction of the parts of the body, and thus deserve to be denominated original—or they may be applied at any period of life accidentally or incidentally.

Exciting causes may be briefly characterized as the several agents which when operating upon the subject, have the prompt and definite effect of developing some form of morbid action. I have said that these causes are not uniformly separable or distinguishable from each other in their influences. Some of the most obscure predispositions are strong enough to urge on the occurrence of manifest or open disease, without the intervention of any known or obvious mode of excitement—nay this spontaneous development of disease, is often inevitable and irresistible; and on the other hand, we find the invasion of numerous maladies, utterly independent of all supposable predisposition, coming on at once upon exposure to their source. It is on this account that I am disposed to substitute the distinction formerly instituted, of causes of disease into the specific and incidental. The specific poisons, malaria, contagions, endemic and epidemic vitiations of the atmosphere, are all of them (with many others that might be enumerated,) both predisposing and exciting; or rather they are indifferent to all previous states of the constitution and capable of immediately impressing it with a malignant impulse. The *modus operandi* of these several causes is as obscure as the intimate nature of disease itself. In regard to a very large class of disorders we may safely affirm, that the production of morbid action or disease in the abstract, is to be attributed to the influence of exciting causes, properly so called—occasional or incidental agencies—while the nature and form of the train of effects

produced are mainly determined by the predispositions existing already in the constitution, or in the parts of it which may have been affected. Two persons being alike exposed to sudden change of temperature, one of them whose respiratory organs are unsound or irritable shall be attacked with bronchitis or pleurisy, while the other whose digestive system is more liable to disorder, shall suffer from colic or dysentery.

Parry, Broussais and others have taught, that the effect of these causes is only an increased intensity or enhancement of the natural actions of the parts affected; in other words, that morbid action differs from that which is healthy simply in force or degree. Their reasonings upon the subject are, however, entirely unsatisfactory, and their theories altogether unfounded. They have lost sight absolutely of the specific nature of some of the causes of disease, dwelling only in the argument upon such as I have called incidental; and here lies the source of their error. Where we attribute disease merely to excess, it is evidently difficult to draw the line either in regard to the application of the cause, or the production of the consequences. It is logically clear that an effect must have a definite relation to its cause; hence it follows that the contagions, malaria, arsenic and nux vomica, as they specifically differ each from all the others in nature and properties, must produce maladies specifically different in character. Accordingly we find a most obvious and striking variety in the results of the disordered action by which they manifest themselves; we find new secretions gifted with strange properties, possessing unaccustomed chemical qualities—and as in small pox, endued with wonderful powers of extension and reproduction; in other instances, as in cancer and fungus hematodes, we are annoyed with irrepressible growths of new and malignant formations. That such remarkable differences in the results imply similar and essential differences in kind, not merely in degree—in the nature, not merely in the intensity of the actions by which they are brought about, is a plain and obvious conclusion, which the ingenious writers above mentioned have entirely failed to set aside.

Predisposing causes may be either internal or external, original or accidental. All individual peculiarities of form or structure, all irregularities or departures from the ordinary configura-

tion of the body and its several parts, must necessarily lay the foundation for the ready occurrence of some functional disorder, or by the impediment thus offered to the proper development of some one or more of the organs, give rise to maladies connected with such defect. Thus congenital shortness of the neck gives, in advancing life, a notable liability to apoplexy, by allowing the blood a more prompt and forcible propulsion into the cerebral vessels, than they will bear with impunity, even under moderately increased excitement of the circulatory system. A contracted or misshapen thorax is the obvious origin of well known tendencies to disorders of the respiratory functions. The deficiency of the *pigmentum nigrum* in the eyes of the albino, is a miserable peculiarity, by which he is rendered morbidly sensible to the universally delightful stimulus of light, and subject to ophthalmia, from the admission of very small quantities of it to the irritable organs of vision.

It is here that I would arrange also the various Temperaments, as they are denominated by physiological writers. The signs or circumstances by which they are denoted and described, seem to me clearly indicative of a disproportionate development of, and determination to some particular system of parts, or apparatus, or set of tissues, and a correlative or contrasted imperfection of certain other tissues, apparatus or system, rendering both these structures so defectively constituted liable to correlative or contrasted forms of disease. The history of temperaments, therefore, belongs not to physiology, but consists of a detail of morbid and pathological phenomena. Thus in the sanguineous temperament we have depicted a notable pre-eminence of circulating power, with peculiar facility in the process of sanguification; hence arises a peculiar tendency to the phlegmasiæ and other maladies, of which hyperæmia is a part, or which depend upon the force or momentum with which the blood is propelled—as hemorrhage, apoplexy, etc. In the phlegmatic we have a condition of the vascular system directly contrasted with the above. There is imperfect assimilation with consequent torpor and sluggishness of the nutritive and secretory functions. There is liability to glandular obstructions, to deterioration of structure, to imperfectly organized or inorganic depositions, etc., as in tubercle; or transudation from the atonic capillaries, as in dropsy. The nervous

temperament, which is also sometimes entitled the poetic and the melancholic, is characterized as these phrases import—by inordinate susceptibility of the sensorial system. The senses are acute, the faculties of the mind active and keen; the imagination is especially lively. These qualities imply great mobility and irritability—physical, intellectual and moral. The spirits are easily elated and depressed—the functional movements of all the organs readily modified and disturbed. Spasmodic and convulsive affections promptly follow any mode of irritation. Hallucinations eagerly admitted and warmly entertained, run into many varieties of insanity, while the restless and anxious desire of excitement soon brings fatigue, satiety, ennui and despair in its train. It is almost exclusively from this temperament that the unblest grave of the suicide is filled. We should observe that these several temperaments—the constitutional peculiarities referred to under that comprehensive word—run into and mingle with each other, so as to be found usually combined and complicated, seldom absolutely simple and unmodified. In like manner the individual peculiarities and those of the class, will be multiplied, varied, and complicated in a definite relation with the variations of structure and conformation with which they are indissolubly connected.

From all this it is evident that a man whose frame is so organized as best to promise the enjoyment of health, and to endure unimpaired throughout the longest protracted life, should be of no marked or notable temperament. All the original tissues should be proportionally developed; the several systems of parts, should be so equal in power, and their energy of action so nicely balanced, as to render it impossible to determine or point out the preponderance of any. I need not remark that such a state is exceedingly rare—nay—I might perhaps safely go so far as to affirm that the production of so perfect a constitution is beyond nature and without example.

It is important to keep in view throughout our discussions, that law of organic life which ensures the hereditary transmission of individual peculiarities, both of structure and function. Thus we have races built up, sectarian and national physiognomies indelibly stamped, and inevitable tendencies to disease engendered. Deviations from the more perfect conditions of the

bodily frame, from whatever circumstances they may have derived their origin, may often be thus delivered down through successive generations. We may trace them indefinitely in a single family, in a tribe, in a community; and the instances on record have already accumulated to such a mass, and are offered with such a weight of evidence—are so easily recognized by observation, and so clearly established by experience, as to leave no room for the smallest doubt. There is perhaps no mode of predisposition so strong or so difficult to be evaded, and the term hereditary is applied as well by the learned as the vulgar, to diseases themselves. A certain number only are designated by the employment of this strong, yet not inappropriate phrase; but should I go about to enumerate to you all the maladies which are indeed capable of such transmission, there are few upon the long catalogue of the Nosologist that I should venture to leave out. And how can it be otherwise! The parent communicates to his offspring in the mysterious process of generation, his features, his figure and stature—his complexion and the color of his hair; nay, his very voice, the glance of his eye, and the expression of his countenance. Can we doubt that a similar and equally close resemblance in minute internal structure and modes of action, must be occasioned by the like agency? Some of the most familiar and prominent examples of hereditary transmission of inevitable tendency to disease, are to be found among the various forms of scrofula, and particularly in tubercular phthisis. Descendants of a stock thus tainted, often exhibit the lamentable union of obvious physical deterioration, with the highest intellectual and moral excellence. Their mental precocity, frequent proofs of genius, and readily acquired habits of assiduous industry, command from childhood our respect or admiration, while their soft gentleness of temper, and almost universal amenity of disposition, attract irresistibly our best affections. Alas! these early honors are almost surely doomed to be buried in an early grave. How touching the biographies of the ill-fated youth, whose sun of hope and high aspiration has thus suddenly gone down in premature darkness. Such instances abound in all our schools and colleges, where the very progress of the most zealous favorites of science and literature, seems to tend inevitably to their destruction. It cannot, I fear, be denied, that this

great evil is perceptibly on the increase, and the victims of pulmonary consumption are annually becoming more numerous; nor have our most strenuous efforts yet availed to arrest this downward current. I call your attention particularly to this point. When it is in order for me to treat of this terrible disease, and instruct you in the remedial means to be pursued, after it is developed and detected, I shall in candor, be obliged to make a reluctant and melancholy confession of the almost uniform inefficiency of these means, however skilfully applied. I cannot therefore too often or too forcibly impress upon you the necessity of watching with peculiar jealousy this ancestral predisposition; there is none stronger or more fatal. The most sanguine and gifted practitioner regards with sad despondency a case of hereditary scrofulous phthisis, even in its earliest stages.

Wilson Philip has in one of his ingenious treatises, the following remark: "Much has been said of the nature of hereditary disease; all that is necessary for us to know is the fact that cannot be disputed, that those parts which were most liable to disease in the parent, are likewise found so in the children." The correctness of this cautious statement will hardly be impugned, but we may go much farther without any departure from truth and nature. The morbid conformation of minute structure upon which such predisposition depends, is sometimes communicated so fully and in so exquisite a degree, that the disease itself is developed immediately after or even at and before birth. I shall have occasion to mention to you in detail by and bye, the actual occurrence of scrofulous disorganization in the lungs of embryos, resembling or identical with, the morbid appearances of these viscera in their respective parents. What are we to say of such cases as these? Is the original germ deposited in a defective or diseased state? Or is it rather impressed with morbid change during the gradual evolution of fœtal life, by sympathy, or nutritive communication with the mother, as we see embryos attacked with small pox or syphilis during the pregnancy of a contaminated parent. It is indeed matter of familiar remark that hereditary peculiarities of whatever kind—whether physiognomical, or morbid, or merely eccentric, are more apt to follow the female than the male line of descent—so that we may make it a physiological as well as a legal maxim, "*Partus sequitur ven-*

trem." Yet we must not offer the rule as either universal or exclusive. The communication of male peculiarities (though if possible it is more mysterious and inexplicable) is also matter of every day's occurrence. Nothing is better known than the transmission of gout, to the third and fourth generation, from a luxurious ancestor, through both males and females, often alluded to as a strong exemplification of the fulfilment of the threat or prophecy that if "the fathers have eaten sour grapes, the children's teeth shall be set on edge."

Among the most singular of the hereditary affections of which I have met with any authentic record, is the account communicated to the Massachusetts Medical Society, by Dr. Hay of Reading, of a family subject in a peculiar degree to hemorrhage from trivial causes. He commences his history of the predisposition a century back, during which period he enumerates five deaths in the family from hemorrhage, and frequent instances in which the slightest bruises and scratches brought on bleeding so serious, as to threaten a fatal termination. He observes that "the children of bleeders, as they are familiarly called in the neighborhood, are not subject to this disposition, but their grand-sons by their daughters. The bleeders are distinguished with no great difficulty from the other children of the family, by their complexion and other external marks." A history of similar hemorrhagic disposition transmitted from a negro woman to her descendants, somewhat less striking in degree than the above, was sent me by Dr. DeRosset, of Wilmington, North-Carolina.

Insanity in all its forms, that most awful dispensation of an angry Heaven, thus descends as an infernal legacy from miserable parents to their unhappy progeny. "Of all diseases," says Esquirol, "insanity is most eminently hereditary;" an appalling sentiment coming to us with the force and weight of the highest authority of the age. So strong is the feeling upon this subject, that it has been repeatedly a matter of discussion among political economists, whether it would not be right and proper that these heirs of lunacy should be prohibited by law from marriage—with the view to prevent thus the propagation of so wretched a race of beings. Such legislation, however, although it might offer some slight and partial benefit, would most assuredly fail in the end, of its proposed effect. Descendants of insane families often pos-

sess in early life the finest minds, the fairest forms and most engaging manners: thus highly adapted to feel and to create strong attachments, affection would soon teach their lovers to scorn the fetters which the laws would not suffer them to wear, and their illegitimate offspring would find in the contempt and obloquy to which they would be exposed, new and powerful means of exciting into action their unfortunate constitutional predispositions. None will deny that the human animal, as the noblest of creatures, is worthy of all care and attention, though every scheme which has for its object the improvement of his attributes and condition, physical and intellectual, is invariably sneered at, and its proposer regarded as a ridiculous visionary. In defiance of "the world's dread laugh," however, I will avow that I do not despair of the arrival of a period when more rational and enlightened considerations of these subjects shall prevail, and the breed of men shall be thought worthy of at least as much foresight as the breed of cattle and horses. When that day comes, parents will not sacrifice their daughters to the hereditary lunatic, nor to the worn out debauchee; nor will it be looked upon as improper, or indelicate, or unreasonable to substitute for the present inquiries as to estate, dowry, and means of living, such questions as shall inform them concerning the moral and physical soundness of those to whom they are to commit, not only the immediate happiness of their offspring, but the hopes and prospects of their posterity to all future time.

We may next refer to those predispositions which result from the sex of the individual. Man with greater physical and mental energy, is more liable to sthenic and inflammatory diseases, while the delicate and mobile frame of woman yields with pliancy to slight impressions, being easily excited to all irritative affections, exhibiting at the same time, as much or even greater tenacity of life. It is not, I think, unfrequent, in stories of "moving accidents by flood and field," to find woman surviving her more robust partner. Less able to struggle with calamity, a wise and bountiful Providence has endowed her with superior power to endure it. Age has also its special tendencies to disease, so numerous and so familiar that it would be a useless waste of time to set about to enumerate them. Not only does a transient influence of this nature perpetually act and subside, even in

the soundest constitutions, as at dentition and puberty, but a modifying, controlling and suppressive power is exerted in the most tainted constitutions. Thus gout rarely appears before the period of ripe manhood; and in the descendant of strumous parents, the time of development is found to determine the mode and location of the scrofulous disease—in infancy the skin and eyes, next the joints and glands, and after puberty the respiratory organs will show successive deterioration. Infancy has limited susceptibilities. It may be said to be free or nearly so, from the invasion of idiopathic fevers, and is gifted with notable powers of resistance to all forms of contagious disease, the exanthemata excepted, and pertussis. As we grow older a wider range of impressions is admitted. At and near puberty, changes occur in the determinations to the several systems of organs, giving new liabilities and diminishing the old. To both sexes this is a period of some risk, but the female is most apt to suffer. She suffers exclusively from correlative changes of constitution at “the turn of life,” as it is called among women; that point at which the prime of existence being past, we begin to feel the evils of decay. Women always regard this epoch, and justly, as a critical one, from the disturbances which attend the cessation of the uterine and ovarian functions. Old age brings with it a long train of maladies, grouped together and graphically described by Sir Henry Hallford, under the title of “Climacteric Disease,” from the date at which they commence. They are readily traced, however, as separate effects of the impairment and decrepitude of the several organs and their functions. Color is in this relation, a topic of especial interest to us. We have been long accumulating histories of the maladies of the white race, but our records are meagre in regard to any of the other varieties of men. We know literally nothing, speaking professionally, of the constitutional peculiarities of the red man, so long our reluctant, and so often our hostile neighbor. Of the black, we have been forced to learn something, from interest and from humanity. We have found him singularly insusceptible to some of our diseases, as for example, those which owe their origin to malaria. Spasmodic affections readily assail him, although such susceptibility seems unaccountable when we reflect on the obtuseness of his senses, and the want of

development of his nervous system generally. He sinks promptly under the violence of inflammatory disorders, and does not bear well energetic measures of positive depletion. He falls readily into the typhoid affections; beneath the attack of cholera his vital forces subside with scarcely an effort; and from his very birth he is peculiarly liable to trismus and tetanus. The recuperative forces of the negro, indeed, seem in a general way less elastic, and exhibit less activity. He is incapable of enduring cold, and requires for his comfort and the development of his powers, high degrees of heat and other modes of excitement. While reasoning thus, however, concerning the black, it must not be forgotten, that even in regard to those immediately about and among us, we have not taken care to separate properly in the consideration of their characteristic peculiarities, the influence of the various agencies of habit, occupation, mode of life, etc., from the inevitable and original predispositions arising from color and constitution. On the whole, we ought to confess that there is a wide field here, yet unexplored, and that much remains yet to be learned by our profession concerning this class of our patients.

Under this head of original predispositions, we next class *Idiosyncrasies*, as they are technically termed. Some of these strange and unaccountable peculiarities are clearly connected with individual structure and conformation, while others would seem to be obviously of accidental origin, and therefore more properly to be arranged among the sympathies and antipathies. As examples of the first kind we may notice the liability, sometimes common to a whole family, to be affected in an unpleasant manner by flavors and odors not generally disagreeable, such as the smell of an apple and other fruits, and of various flowers; though the poet has thought fit to satyryze as affectation the exquisite sensibility which "dies of a rose! in aromatic pain." Several instances are recorded in which the smell of ipecacuanha regularly brought on a paroxysm of asthma. In the case of a lady whom I knew familiarly, there was always a notable degree of general distress, accompanied with dispnœa, occasioned by the flavor of an egg, whether raw or prepared, whether alone or mingled in any mode of cookery. When the smallest quantity of any such preparation was inadvertently taken into the

stomach, the uneasiness produced by the perception of its presence, was aggravated into intense sickness and vomiting. Whether in all these instances the origin of the morbid influence may not be ascribed to some actual injury inflicted, or former deep disgust excited by the specified agent, continued or repeated by those associations which both mind and body form so quickly, and which adhere to them with such tenacity, is, as I have said, doubtful. But even if it be so, must we not acknowledge the whole train of results to be laid in some original peculiarity of constitution? Thus we find individuals and whole families on whom antimonials act poisonously, occasioning painful and dangerous spasms of the stomach and of the muscles of voluntary motion; and others who cannot take opiates without great suffering—delirium, head-ache, nausea and prostration. Such cases might be multiplied indefinitely, and should be kept in mind as forming subjects for unremitting and careful inquiry in your future practice. That these idiosyncracies impede and limit the remedial effects of medicaments in numerous instances in which their influence has not been suspected, is highly probable, and even food and drinks in particular forms, may exert an agency upon the stomach and general system, more or less prejudicial to invalids and convalescents.

Of accidental or acquired predispositions the number is so great, and the sources so widely distributed, that any attempt to detail them would be entirely futile. Striking examples may be adduced in the recurrent and paroxysmal class of diseases; all indeed of which periodicity is an attribute; asthma, epilepsy, hysteria, furnish us with melancholy instances in which a single attack seems but the first of an interminable series. The repetition of the paroxysms of intermittents at regular intervals; the association of certain morbid movements in the system, with the revolution of noted periods of time, is one of the most familiar phenomena of pathology. Sometimes we ascribe this periodical disposition to the peculiar influence of a morbid poison, as in the case last adverted to, and in the other malaria fevers: but all fevers, the hectic or secondary as surely as the idiopathic, observe this precise regularity of movement. There must be something inherent in the very nature of things, something belonging to the essential history of the animal constitution, which gives founda-

tion for this law of the economy. I shall hereafter speak of the suggestion that it is owing to planetary influences. Whatever may be its origin, its effect we know to be much aided by the force of habit—a power which sways all the actions of all our organs, and often in a singularly uncontrollable manner; deserving sometimes indeed to be regarded as among the most formidable causes of disease. Nothing can be more obscure than the nature of these periodical changes in the condition of a tissue or part, so transient yet so vehement, often leaving as in epilepsy, no trace whatever of anatomical change, yet producing, while it lasts, such intense sympathetic disorder of the system. In another class of cases we account for the liability to future analogous attacks, by observing some alteration in the part affected, as in rheumatism, mania, pulmonary inflammation, and gastro-enterites generally. There may be a permanent enlargement of the smaller vessels, giving occasion to a degree of hyperæmia, an element in almost all inflammatory affections. This is perceptible in persons of weak eyes, as the phrase is, and those subject to frequent sorethroat, in whom the vessels of the conjunctiva and mucous membrane, may be traced, of inordinate size and fulness; or there may be the opposite condition of consolidation, or closure or obstruction of vessels from effusion or deposition. This will of course impair the integrity of a tissue or organ, and even when its common actions are not impeded, offer a degree of difficulty in the occasional excitement of any increased action, or any accidental demand for increased secretion.

But diseases not only pave the way for their own recurrence, but they also develop, or give rise to predisposition to other diseases. The sequelæ of measles and of variola, are often more to be dreaded than the original attacks; diarrhœa, ophthalmia, inflammatory and convulsive coughs, remain long after the fever and cutaneous eruption have subsided, and are ever after more readily brought on. They are said also to aid the development of scrofula. Vaccine is accused, not without some plausibility, of generating a troublesome series of cuticular affections. Nor must we omit to notice the contrasted fact, that one class of maladies at least, the exanthemata, and perhaps the contagious fevers also, destroy or vastly diminish the liability of a constitution, once affected by them, to be attacked a second time. The

modus operandi exerted here, is totally unintelligible: so also where one seems to prevent or greatly modify the future invasion of another, as in the influence of vaccine on small pox.

We proceed next to the consideration of the external sources of predisposition, and under this extensive head we shall find ourselves obliged to refer to almost every class of circumstances, surrounding and acting upon us. Climate is perhaps the principal and most important of these means of modifying the condition of the system. In conjunction with original differences of stock, and variety of tribal descent, it is the source of what may without impropriety be termed national temperaments. The swarthy Spaniard and the Italian, with black eye and hair, may be placed in contrast with the blue-eyed and fair-haired German and Scotchman, as presenting diversities of climatic susceptibility to different forms of disease, not less notable than their opposite conditions of physiology and constitutional temperament. The foggy Hollander is proverbially of phlegmatic habit and disposition; while the Englishman and the Turk, are even less contrasted in complexion, than in the nature and rapidity of the maladies which affect them. Individual exceptions to the rules thus proposed to be laid down may, without doubt be met with, and perhaps not rarely, but their truth and force are clearly exhibited in the mass. Indeed, so striking is the power of climate in modifying the external signs of the internal constitution, that some philosophers have been led to believe it adequate to account satisfactorily for the variety of races of men, all the diversities of which, they attribute to the agency of the sun which beams upon them, and the soil which they inhabit, aided, perhaps in some measure by the influence of manners and habits, themselves the products of the sun and soil.

The nature of the surface, the geological as well as the geographical locality, is deserving of attention. In low, flat, alluvial regions, the inhabitants are subject to known forms of disease, varying less in their character than their intensity and violence, according to the degree of solar heat, to which they may be subjected. In northern latitudes these maladies assume the chronic and intermitting types; within the tropics they are generally prompt and rapid, often extinguishing life as malignant remittents, and in the continued fevers, within a few hours.

It is not easy to say why this combination of heat and moisture, with the products of organic decay, so vivifying to the vegetable kingdom—so genial to the inferior animals of all kinds, from the elephant to the lowest reptile, and so infinitely productive of insect millions, should be thus unfriendly to the health, and even to the existence of the higher races of men. The arid deserts of Arabia, on the other hand, are said to present frequent instances of wonderful longevity; and if we may believe travellers, sickness is scarcely known among the wandering hordes that traverse them, finding at various points an uncertain home, though their supplies of food and drink are both scanty and unwholesome. Even in hilly countries we find the fertile meadows and low grounds fringing the margins of the rivers and smaller streams, the frequent seats of disease; whether from the presence of mere moisture or the evolution of a specific poison is a question to be hereafter discussed. Mountainous regions seem, on the whole, most favorable to health and longevity, provided the cultivation of the soil, which in these elevated positions, is usually comparatively infertile, be sufficiently productive to obviate the risk of actual suffering from defect of nourishment. The imperfectly ventilated vallies among the ranges of mountains, however, are found in every part of the world, to be subject to some special forms of disease. Bronchocele or goitre is one of these. It is so often met among the alpine glens, that it was long attributed to snow water, the only or chief supply obtained there. But in the coves of the Alleghany it occurs frequently, where men drink of the purest springs. In the same districts is generated also the terrible poison which produces milk-sickness, afflicting not only man, but many of the lower animals.

These local endemics are in certain instances extremely obscure, and the closest examination does not detect any apparent source to which they may reasonably be attributed—as the frequency of tetanus in the West Indies, Santa Cruz especially—the Barbadoes leg and the pellagra of Lombardy. Perhaps the best test of the salubrity of any region of country may be found, not in the enjoyment of pleasant temperature, the luxuries it offers, nor the selected instances of longevity which may be met with, but in the fruitfulness of its women and the rapidity of increase of its

inhabitants. In these respects it cannot be doubted that the colder climates have the advantage, not only of tropical but even of the temperate latitudes. The progress of large masses of men has uniformly been from north to south. Thus Europe has been repeatedly overrun by hordes of hyperborean barbarians, such as the Huns and Goths and Vandals—and seems doomed, heaven avert it! to be again reduced to slavery and wretchedness by a hardly less savage tide from Muscovy and the banks of the Don. Why this should be so, and how an iron soil and an inclement sky should give life and vigor to a greater number of human beings than can find room and obtain subsistence where they are born, are questions as embarrassing to the naturalist and physiologist as they are to the political economist.

The state of society is a topic which should by no means be omitted, in treating of the causes which originate predispositions to disease. Man in his primal condition, it may be supposed, was subject to few and simple maladies, and old age, with its gradual decay, was probably the principal outlet of human life. But it is also reasonable to conclude that this decay must have supervened earlier, the constitution must have been worn out sooner, under the violent exertions, the alternate excessive fatigue, and indolent repose, and the frequent and severe sufferings from the difficulty of procuring subsistence in the state of savagism, than under the contrasted advantages of civilization. It is owing to these circumstances that wherever they come in contact with each other, the tribes of savages melt away before the face of civilized man. The latter increases more rapidly; his women are more fruitful; his descendants, as a mass, possess greater strength and agility. We are apt to be deceived by fixing our attention upon the strange stories occasionally told, of Indian activity and energy. Individuals among them may from continual training, arrive at the possession of great physical power; but as a body, they are far inferior in muscular capacity to our mechanics and laborers, and will not compare with our equestrians and pugilists in either strength or activity. To praise them for their endurance of hunger is indeed to “make a virtue of necessity;” their lazy improvidence inures them against their will, to long fasts, which after all, there is no proof that they bear better than other men. Nor can the Indian sustain greater or more prolonged fatigue

than the hardy seaman, the enthusiastic hunter, or the post-boy and courier of civilized life. The idle dreams of certain half lunatic philosophers, such as J. J. Rousseau, would exalt the savage to the station of a demigod. But be not misled by these absurd speculations; examine for yourselves, and you will soon cease to doubt that, setting aside all the moral and intellectual improvements which civilization brings in its train, the physical man in cultivated society, is infinitely superior to the barbarian. It is nevertheless true, that the refinements of life have been the occasion of much suffering from disease; indeed it ought to be acknowledged, that many of our present list of diseases arise, or derive force from the circumstances of civilization. Yet there are few or none of these which when introduced, have not been accompanied or soon followed by their appropriate remedies, or at least such compensation, that the balance is left decidedly in our favor. Civilized man not only lives happier but longer than his savage ancestor; and the prospect before us is farther brightened by a knowledge of the fact, that the evils of refinement are by no means multiplied with the same rapidity as formerly, while the increasing industry and skill of medical philosophers, aided by the philanthropic exertions of enlightened legislators, are daily diminishing the number and intensity of the sources of disease, and gradually narrowing the widest outlets of human life.

In proof that these views are not merely pleasant imaginations, I would point you to the comparatively limited ravages of the plague, the terror of our ancestors, both of France and England; to the scarcely less than total extirpation of the small pox; and to the triumphant operations daily proposed in modern surgery, many of them almost miraculously successful in preserving life, and restoring the capacity for action and for enjoyment. On the other hand, it must not be denied that the cultivation of feeling and taste in refined society, has substituted for the moral indifference and stoicism of the savage, a dangerous, perhaps a morbid degree of mobility and sensibility, to which we must attribute in some measure, the greater frequency of insanity. This result is furthered by the fluctuations of commerce and politics, and the excitement of the distracting passions of fear and avarice. Of late too, we over stimulate the young intellect, by an anxious,

busy and precocious education, which occasioning too urgent determination to a delicate organ by nature and necessity of slow development, originates a predisposition to all the forms of cerebral disorder. This evil is however perceptibly on the decline, and common sense will soon rescue our infants from the hand of the too zealous pedagogue, and turn them loose from the confinement of the school-room into the fields and gardens. It is pleasant to reflect also, that if there is more lunacy, there is less idiocy than among the various tribes of savages ; and an additional consolation remains yet in the fact, that obvious improvements are every day made in the treatment of insanity, by which the condition of its unhappy subjects is not only rendered far less terrible, but the proportional number of cures is becoming vastly augmented.

The influence of the various conditions of the several classes of men, is next to be noticed, though in this place in a very brief and general way, as they not only give rise to definite predisposition, but rank among the most forcible of the exciting causes of disease, and are hereafter to be frequently referred to. Agriculture offers us, doubtless, the most healthful of all occupations. The labors of the farmer, though unremitting, are not burdensome ; though regular, are free from monotony, and varying with the seasons, give pleasant excitement to the mind. It is not easy to point out any predispositions as liable to arise from this primitive and tonic mode of life. Physically speaking, it is the most enviable lot of humanity. The citizen, on the other hand, deprived to a greater or less extent of the luxury and stimulus of fresh air and free exercise, languishes under a deficiency of muscular strength and digestive power. The sedentary artizan and the manufacturer, like plants shut out from the influence of light, possess and transmit to their descendants, a sort of imperfect vitality. Of all the dwellers in cities, the mechanic suffers least, provided his occupation gives him free muscular motion, and shelter from special or undue exposures. Lastly, we mention the student, who can scarcely avoid deterioration of health from his pursuits. His frame is attenuated by defective nutrition and imperfect muscular development ; his thorax contracted and deformed by the bent posture which brings his dim eyes nearer his books and papers, and allows him to support his feeble body

against his desk or table. Incessant mental labor determines disproportionately to his brain, he becomes the ready victim of the various types of cerebral disease, and the long list of maladies which ensue from deficient development of other organs, and he lives a martyr to dyspepsia, or dies prematurely under the gradual wasting and sure decay of pulmonary consumption.

CHAPTER II.

EXCITING CAUSES.

It is common to speak of the various agents, which effect, by a prompt and obvious impression on the living system, the development of some mode of diseased action, under the general head of exciting causes. I am inclined to attribute disease in the abstract indeed, to the forcible impulsion of some such agent, endowed with a morbid force, either by virtue of its inherent qualities, or by the contingency of its being discordant, at the time, and under the circumstances, with the condition of the vital susceptibilities. The particular form which the attack so produced will assume, will generally be determined by the special predispositions of the subject affected. The rule thus laid down, is, however, liable to so many exceptions, that their number may seem to impair the precision and value of the definitions given by authors. It is indeed very often difficult to distinguish between these two classes of causes. The very terms, predisposing and exciting, are occasionally applicable equally and alike to the same morbid agency; and there are many circumstances which give rise to disease, which it would be difficult if not impossible to arrange exclusively with clearness or confidence under either head. Thus, for example—that state of the atmosphere which we vaguely denominate an epidemic constitution of the air, may both predispose to and excite a given form of disease; so may marsh miasms and all the poisonous exhalations comprehended in the phrase malaria; and

so in an especial manner may the virus of any spreading contagion. All these determine definitely and with remarkable uniformity, the nature and course of the results of whatever influences they exert upon the animal constitution. On the other hand, there are some predispositions of the most obscure and untraceable character, which nevertheless exhibit an uncontrollable power of developing special maladies, without the aid of any occasional mode of excitement whatever. In a gouty system, for instance, the hereditary tendency may be so strong that no evasion shall avail—no human prudence or foresight prevent the occurrence of paroxysms and attacks both functional and organic, such as are usually and justly attributed to excess or intemperate indulgence. Podagra is affirmed occasionally to show itself in youths, and even children, absolutely excluded from all the contingencies adapted to give it existence. The same thing is perhaps even more strikingly true of scrofula, which, as I have had occasion to mention to you, has been known to exhibit itself in its open forms in the infant at birth.

There is nothing in the history of the human constitution, perhaps, more remarkable than the readiness with which it accommodates itself to all possible diversities of situation, custom and habit. In all his external relations, indeed, man is the creature of habit; nay, his very instincts would seem to undergo some modification from its proverbial influence. Yet with this slow and permanent pliability, there is connected a corresponding susceptibility of disturbance from the impression of sudden alternations; and hence it arises, that among the principal in importance, the most general in extent, and the most frequent in occurrence of all exciting causes, we must enumerate these alternations; changes of temperature; of all the other atmospheric conditions doubtless though less appreciable, as of its electric and magnetic states, its moisture and dryness, etc.; of local position; of occupation; of enjoyment; or of suffering. In all these respects, any notable and abrupt departure from the usual train of contingencies by which he is surrounded, cannot be borne without injury and disorder, proportioned chiefly to the force of contrast to which he is subjected, and modified by the varying capacity of accommodation inherent in each individual.

The most superficial observer cannot be ignorant of the effects of change of climate, which this day of emigration affords us innumerable opportunities of witnessing. Vegetables removed from their native soil, and from the region of country particularly adapted by nature to their growth, are apt, unless guarded with special care, to wither and die at once, or to degenerate more slowly and finally decay. Animals are somewhat less limited to local position, although subject to the same law. The camel may live, but cannot keep up his number any where else than in the sandy deserts of Asia and Africa. The lion, the tiger and the elephant may procreate but cannot multiply—perhaps cannot exist permanently as a race except in the torrid zone; the lama is found only in a narrow region of South America. Those creatures which man has domesticated are aided by our care to withstand the shock of transportation, and the horse and dog accompany their master all over the globe. Those wild beasts which we find in contrasted and distant climates, do not fail to exhibit obvious modifications of external appearance, tending to fit them for the opposite circumstances in which they are placed. Bears, hares, foxes and wolves, in extreme northern latitudes, have their fur thick, fine and long, and of a snowy whiteness—by these qualities of their covering being protected from cold. In an analogous way, too, their very instincts as we call them, are modified, so as to preserve them from collision, if I may so express myself, with external nature. The tribes of the human family exhibit, as we should anticipate, still more extensive powers of accommodation, without which, indeed, the divine gift of the whole earth as their domain would have been at least partially nugatory. Endowed as he is with wonderful powers of observation and reflection, man is capable of preparing for and guarding against all the modes of impression to which he subjects himself by change of place, and may thus accommodate himself to every new condition of climate, and repel or evade the influence of the most opposite extremes of temperature and other circumstances. I say he may; for with all his boasted reason he frequently commits in this regard errors the most stupid and wilful, and runs headlong into the very dangers he is warned most loudly to shun. Under the burning rays of the bright sun of Hindostan, and in the pestiferous islands of

the Caribbean sea, the English army and naval officer wears his thick broadcloth uniform, and instead of the vegetable aliment, subacid fruits and cool sherbet of the native, feeds high the fevers which consume him, by the hot wines, fermented liquors and stimulating meats and sauces of his native home.

Commerce as well as conquest has been hitherto in the hands of northern nations, who are by both these means introduced in vast numbers every day into regions the very antipodes of the lands which gave them birth. The British troops who lately, in the prosecution of the most unjust war by which the annals of our race are stained, took possession of the island of Chusan, paid an immediate penalty by the almost universal sickness which seized them, and their absolute decimation. We ourselves are so situated, unfortunately, as to have before our eyes a perpetual succession of examples of the evils of which I am speaking. Europeans emigrating to the countries between the tropics are not more notoriously liable to be assailed by diseases peculiar to their new position, than are our northern brethren who come to reside in the low, fertile, alluvial districts of the south and west. So surely and uniformly is this the fact, that it is expected among us, almost as invariable matter of course, that every such individual shall undergo a seasoning, as it is commonly termed, that is, an attack more or less severe of some form of endemic disease peculiar to the warm months, before he is acclimated, that is, assimilated in constitution and habit of body to the condition of a native or old resident. And the anticipation is surely not unreasonable. We know the fact that all abrupt and violent transitions tend to produce vehement and morbid impressions, unless measures be taken to prevent or modify the results of their specific influences. With this view a newly arrived emigrant from more northern regions should avoid the heat of our noon-day sun and the chill dampness of our abundant night dews; he should yield in some measure to the warning langour which will oppress him, especially in the hot afternoons of summer and autumn; he must guard against every mode of excess, physical or moral, and shun fatigue, indulgence of passion, and all degrees of intemperance in the use of food and drinks.

Heat, when intense or protracted in its application, we know

to be, alone and of itself, capable of producing many and fatal diseases; inflammatory fevers, coup de soleil, apoplexy, these are the direct consequences of its agency. But the morbid effects of high temperature which are most common in hot climates, are somewhat indirect, and are not satisfactorily accounted for like the above named affections, by its merely stimulating power, or its property of expanding the vital fluids. A large class of disorders of the digestive system, the stomach, intestines and liver are arranged under this head. They are ascribed by James Johnson, with much ingenious reasoning, to the action of heat upon the surface of the body. With this surface he supposes the liver to be connected in a peculiarly close and collateral harmony of actions, which he terms "the principle of hepatico—cutaneous sympathy," by virtue of which an inordinate action of that great and important organ necessarily follows the excitement of the skin under the influence of heat. How far these speculations may suffice to explain the origin of the maladies peculiar to southern countries, it is not easy to say; proofs are not wanting, however, of the concurrence of cutaneous and hepatic derangement in tropical countries and low latitudes. The skin is covered with prickly heat, an annoying and well named eruption, and becomes yellowish or sallow; there is impairment of the appetite and digestive powers; diarrhœa often occurs, exhibiting an increased and vitiated secretion of bile; dysentery or fever with the same complication present themselves; or cholera, or true hepatitis, acute and chronic, and jaundice; with all these, or it may be, independently of them, the subject is conscious of a marked and universal depression of both mental and bodily energy. It must not be imagined that in pointing out the stranger as the victim of these deplorable influences, I mean to imply his exclusive liability to suffer under them; far from it. The native tribes of these torrid regions derive many or most of their idiosyncracies of habit and constitution from the same influences, so far at least, as they are unprotected by a modified organization, internal or external. Hence their langour, their comparative imbecility, their defect of elastic force and want of vital tenacity, so terribly demonstrated by the mortality of pestilential visitations among them.

The opposite climatic condition of cold, severe and long con-

tinued, is also a very powerful exciting cause of disease. The extreme parts of the body when subjected for a time to a temperature impressively low, readily lose their vitality; the circulation in their small vessels becomes weaker and weaker, until it stagnates and they are said to be frost bitten. In a less degree, the same causes produce a well known and troublesome affection termed *pernio* or *chillblain*. The influence of cold being extended and still farther protracted, there is great drowsiness, with lassitude and extreme dislike to muscular exertion. A deep sleep comes upon the unhappy patient, who is doomed, if he lies down to indulge himself, never to rise again. The long winters of high latitudes produce a permanent constriction and harshness of the cutaneous surface with a coincident and obvious diminution of all the secretions and excretions, the urine excepted. Hence constipation, colic, glandular affections, rheumatism, catarrh, and a variety of pulmonary disorders which, acting promptly upon tubercular predispositions, give rise to frequent phthisis. It is scarcely necessary to say that the southerner is more liable to these evils than the natives of these northern climates, though the latter do not fail to exhibit forcibly enough their unequivocal tokens.

Nothing can be more obvious than the danger of great and abrupt alternations of temperature. They are indeed familiarly remarked to be among the most efficient and certain of the long catalogue of exciting causes of disease. No one can fail to perceive the probability of a severe shock to the system, when exposed to the sudden contact of a current of cold damp air, while heated by unaccustomed exercise or confinement in a warm room and bathed in a relaxing perspiration. The sensation of chilliness or the actual rigor which is the almost inevitable result, is of course attended with an immediate constriction of the skin, the fluid expelled from whose vessels must be determined with an irregular force and velocity upon the internal organs and surfaces. Thus commences a train of morbid actions, which can scarce fail to result in the production of some one of the *phlegmasiæ*, rheumatism, or catarrhal fever. Nor must we overlook the danger of the application of heat after cold, which though seldom thought of or provided against, seems to me at least as full of risk as that of cold

after heat. In this case we have the vessels of the cutis while braced to their highest degree of tone, hastily and unduly stimulated, and their fluid contents expanded and augmented in volume. Unable to yield with sufficient promptness to this dilatation, or to relax into the state proper for their normal offices of excretion and transpiration, they are affected with a morbid excitement; the surface becomes hot, dry and harsh; the great organ of circulation sympathizes with the irritation thus produced, and fever is aroused, whose type, force and future history must depend for the most part on the existing predispositions of the subject affected.

We next proceed to consider the agency of food as an exciting cause of disease. Man is an omnivorous animal, and among the infinitely varied articles of diet which he employs either to sustain life, or to add to his list of luxuries, we shall find many things possessed of qualities injurious or dangerous, and many which from changes of the condition of the stomach may become deleterious. The experiments of Magendie prove that animal life cannot be supported by an exclusive use of any of the nutritious principles found in food. For the production of healthy and well assimilated chyle, neither gum nor oil nor sugar alone will suffice. The scurvy which affects sailors during long voyages and which is probably destined to disappear before the improvements in navigation and in the modes of preparing ship's stores, is occasioned by their confinement to a diet of salted meats and fish without due intermixture of fresh vegetables or fresh meats. It always subsides when variety is offered—though the articles resorted to, as in the instance of the acids so highly eulogized, may add little or nothing to the actual amount of convertible aliment taken. Similar diet on shore does not produce similar effects, simply because it is never quite as exclusive; yet though it does not give rise to scurvy, we see it originate many other cutaneous and gastric disorders. I cannot go into detail on this very extensive subject—but shall leave it with one farther remark which deserves to be recollected by all of you—that as almost every production of nature and art may be taken with impunity when sanctioned by habit, so the most nutritious and digestible substances may act as dangerous irritants to those unaccustomed to their use. Hence we find that all sudden and notable changes

of diet are apt to occasion greater or less disturbance of the digestive organs.

The same observation is equally correct as to our habitual drinks. Water itself varies so much in the several soils from which it bursts forth in springs or in which it is collected in wells, bearing in solution so many ingredients of widely different chemical and specific qualities that it may become an exciting cause of disease. Diarrhœa is familiarly known to be brought on in strangers by the water of the Mississippi, and of the limestone districts of the west, and even of the impure wells of our own alluvial country. In certain regions, nephritic disorders are frequent and calculus is common; and I am inclined to concur in the popular opinion, which ascribes these facts to the qualities of the water drunk there. Malt liquors are accused of giving rise to similar affections, and wine used largely, produces a very peculiar tendency to inflammation and calcareous depositions in the smaller joints. Writers on Hygiene often stigmatize, among a great number of articles of common consumption at our tables, the infusions of tea and of coffee as injurious to the tone of the stomach, and in various modes deleterious to the general health. It is difficult to refute the allegations thus urged; it would be uncourteous to refuse at least a partial faith in the statements brought forward to sustain them. It is altogether probable that idiosyncracies exist, which entirely forbid the use of these cordial and delightful aromatics. Yet for myself, I must say that I have seldom or never had occasion to observe the ill effects attributed to these beverages. On the contrary, I regard them not only as grateful and pleasantly stimulating, but in the manner generally employed, as perfectly innocent drinks. As modified by sugar and diluted with milk, there surely can be hardly the least risk in taking them, in all ordinary circumstances of common health.

Condiments, so necessary to the perfection of modern cookery, have been much discussed. In the moderate amount usually mingled with our food, they can do no harm. I am disposed, however, to object decidedly to the free use of acids to which some persons are inclined. Whether in sauces, or in the more objectionable solid form as pickles, they are I think injurious both to the teeth and to the stomach.

I have thus spoken cautiously and briefly of the qualities of our food and drinks, as capable of exciting disease; but they do this, it is probable, far more frequently by the amount or quantity taken, whether considered absolutely or relatively to the condition of the subject. What then shall I say of intemperance, whether in eating or drinking—of gluttony or of sottishness! The voice of an angel could not entice the drunkard from his cups, or the glutton from the gratification of his gross and beastly appetite; though both the reason and the sad experience of each, has left him no doubt as to the fatal efficiency of these most fruitful of all the exciting causes of disease. Our professional duty, in regard to these subjects, is at once clear and imperative; as imperative as any of the commands of God and our conscience—as clear as the evil influences of intemperate habits. We must not omit to warn, with freedom and boldness, though with proper caution and delicacy, all such of our patients as shall have begun to tread this downward path—leading, as surely as the inevitable decrees of fate, to suffering, ruin and infamy. While exulting in the enjoyment of health, and absorbed in the pursuit of pleasure, they would not hear, “though one rose from the dead;” but in the hour of sickness and on the bed of languishing, when oppressed by the distresses which they have brought upon themselves, and borne down by the terrors of impending death, the still small voice of conscience and the earnest and disinterested reproof of their physician, will be listened to and heard attentively. Circumstances like these, afford us opportunities for impressing deeply the minds of those under our care, which no other classes of men enjoy, and they must not be lost!

Paint the immediate and direct consequences of their fatal infatuation upon both mind and body, and you cannot paint them too strongly; the physical torments resulting from excess are not to be described, and the horrors of approaching madness far greater than the efforts of the most vivid imagination can conceive. Detail to them the more protracted and indirect effects of this lingering suicide; the paralytic trembling, the steadily progressive and premature decay, and the early and unhonored old age that await them. It is possible—though I fear I ought not to express any strong hope of such success—it is possible that

you may enjoy the delightful gratification of thus saving some fellow-creature from a terrible self-destruction; by making the attempt you will at any rate secure to yourselves your own approbation and the esteem of all the good and intelligent.

We may next remark, that irregularities in dress are entitled to rank high among exciting causes of disease. Dress should be properly adapted to climate, to season and to changes in the state of the atmosphere, either of temperature, moisture or electrical and other influences, when they can be known. Civilized man lives a life almost altogether artificial. Our infants, warmly wrapped up from the moment of their birth, acquire or retain a sensibility of the cutaneous integument, which in advancing years, will readily receive any form of morbid impression, unless due protection be regularly afforded it. To such impressions the lower extremities seem very specially liable, perhaps from the comparative want of force in the vascular circulation. There is no error therefore, in the common notions as to the danger of sitting or standing with cold and wet feet: and we are but too familiar with the effects to be anticipated from the exposure of the frail form of delicate beauty, unless mantled in furs and thick soft woollen envelopes, to the rough keen winds of the winter night. Much has been written on the choice of materials for our clothing, and especially for the garment to be worn next the skin. Those who regard chiefly the varying electrical conditions of the atmosphere, urge upon us silk as deserving a preference, and there are great numbers who advocate its claims very strongly. Flannel seems to answer every purpose, defending us well against the cold and moisture of the air. When it proves warm and irritating in summer as some complain of it, we may substitute cotton in some tissue or other. Nor can I help adding another to the frequent but unheeded warnings, as to the injudiciousness of employing linen for the inner dress. It is quite unfit for this purpose; being a ready conductor of caloric it renders the surface easily accessible to all changes of temperature, and as it absorbs moisture slowly, the perspiration thrown out from the body is allowed to remain in contact with it, chilling or irritating it according to the heat of the seasons and the condition of the subject. Frequent changes of the interior garment, let it be made of whatever material, are essentially necessary to health. Much of the

predisposition to low fevers met with in our negro slaves, and in the destitute poor every where, seems to me to be owing to the retention, in contact with the skin, of the oily, saline, and other recrementitious substances which it is one of its peculiar functions to eliminate. We see its more direct effect too, in the frequent occurrence of cutaneous eruptions.

In regard to dress, as indeed with respect to all our customs, manners, and social and personal habits, fashion lays upon her votaries certain heavy penalties, which they bear, especially the weaker portion—our women—with the contented spirit of cheerful martyrdom. The female corset, or stays, with their appendages, have been subjects of severe animadversion. They are however susceptible, I think, of a fair defence. They are not necessarily hurtful, but do injury by excess or want of adaptation. They give a graceful support to the form, which they unequivocally improve by imparting an air of firmness and neatness. If laced too tightly, however, they compress the thorax, impeding the respiration and rendering the motions of the body awkward and restrained. The steel-piece or whale-bone in front, if too broad may press upon one or both breasts so as to give rise to inflammation, schirrhus or abscess.

The occupations followed by man in civilized society, and rendered necessary by his artificial wants and luxurious refinements, must not be omitted in our brief enumeration of the sources of disease. They have indeed been already alluded to among predisposing causes, but it is not in that way they chiefly exert their influence. It is almost inevitable that the special use of any one organ or set of organs of the body, shall unduly or disproportionately determine to, develope or excite the parts thus acted on. Hence arises a long train of evils. Even in the external configuration of the body there is a loss of symmetry. The oarsman has a full chest with muscular arms, but ill-shaped and unsightly lower limbs upon which he walks badly. The dancer on the other hand, exhibits large calves and buttocks, with a weak and slender arm. It is not to be forgotten that some modes of employment improve the condition of the organ while others deteriorate it. Thus the sailor accustomed to the spy-glass and always straining his vision to its utmost limit, enjoys a keen and good sight, while the gold-smith and watch-

maker labor under various defects of the organ—near-sightedness, dimness of vision, and frequently ophthalmia. Mechanical irritations are to be noticed, and the results of vehement muscular action. In agricultural districts where it is customary to pare the soil, the laborers who work in this mode can scarce escape hernial protrusions from the nature and force of the awkward postures and movements of the pelvis and abdomen. The miller, the stone cutter, and the needle grinder, suffer bronchial and pulmonary inflammation brought on by the small particles of mineral, metallic and chaffy substances which they inhale mixed with the air they breathe. Ginning and picking cotton render our negroes liable in the same way to similar affections. Coal miners and heavers are said to exhibit after death, not rarely, masses of black dust impacted in the lungs. Still worse are the specific ill effects produced by the specific poisons used in the arts or applied incidentally to the surfaces of the body. Painters become subject to colica pictonum and paralysis, from handling and inhaling the salts of lead. Gilders are poisoned by the fumes of mercury; their gums are swollen and spongy, their teeth loosen and fall out, and a general trembling of the muscular system supervenes. To obtain the same fluid metal from the earth, shortens so much the lives of the miners, that it is the almost exclusive employment of criminals and convicts. Bakers, by kneading the fermenting dough, bring on an obstinate cutaneous inflammation of the hands and wrist. Chimney sweeps only by accident escape the foul and intractable cancer scroti, caused by the irritation of the soot lodged in the folds of the scrotum. In all manufactories, the confinement, bad air, constrained postures, and though mentioned last, yet not least in importance, the wearisome monotony to which each individual is relentlessly condemned by the modern system of minute division of labor, are all calculated obviously to deteriorate the physical condition, weaken the constitution, and depress intensely the powers of vitality. What spring of life can there be found in the bosom of him who knows that his whole earthly existence is to be spent in polishing a button, or sharpening the end of a pin? Hope never enters such establishments as these. Her cheering influences never lighten the dreary labors of the long day spent within their gloomy precincts.

Few if any of the exciting causes of disease are more frequent or influential than the various emotions and passions of the mind. They are usually divided by physiologists and pathologists into two classes, the stimulant and sedative; but in this view of the diversity of their agency I cannot coincide. All emotion, every passion is in its own nature stimulant. This is their original and essential effect. They present, however, the obvious analogy with many physical stimulants, that in the more intense degrees they may overpower, and this instantly, the physical forces; or the excitement to which they give rise, may be very transient and therefore not readily observable, while the consequent depression is fixed and permanent, and cannot therefore escape our notice. Their direct and immediate operation seems determined upon the nervous centres, if I may so express myself—the brain, the spinal cord, and the ganglions of the great sympathetic. They affect the circulation indirectly, and in a very exact proportion to the sensibility and irritability of the temperament of the subject. They quicken the motions of the heart; they render tremulous and unsteady the contractions of the voluntary muscles, though they increase generally the force of the contractions. When intensely aroused and long protracted they strongly tend to overthrow the throne of reason, and produce some one of the forms of insanity.

Anger occasions flushing of the face and redness of the eyes, and by determining the blood forcibly to the head directly endangers the integrity of the cerebral structure, and gives rise to epilepsy and other convulsions, to paralysis and apoplexy. Broussais tells us that this passion “when physiologically considered, is primarily a simultaneous irritation of the brain and the epigastric centre. Hence the vital action of the brain is often changed in the most violent paroxysms of anger into hemorrhages or inflammations which resist the best directed efforts of art.” Nor do the other viscera escape unhurt in the concussions of rage. The same author declares that he has seen it “productive of both hemoptysis and severe pneumonia.”

The effects of violent *grief* are very similar. I have myself seen apoplexy follow a paroxysm of this passion. Hysterical and epileptic convulsions are more common. There is less risk

of injury, if abundant tears from the eyes of the mourner come to the relief of the cerebral oppression.

Joy, when exquisitely developed, readily becomes a dangerous emotion, and by the same pathological influences. The door-keeper of congress fell apoplectic on hearing the news of the capture of Cornwallis. "Prosperity," says an ancient proverb, "is harder to bear than adversity." It is proper to note, that during violent joy and profound grief, the subjects of these emotions refer much of their uneasiness to the region of the heart, which they speak of as "full," "oppressed," and "bursting."

Of all the passions, *fear* is the most annoying and deleterious. Tremor, spasms and convulsions are its frequent effects. It augments, occasionally, certain of the excretions, and relaxes the sphincters, thus giving use to diarrhœa and micturition. It arouses the muscles of voluntary motion to forcible action, endows with immense strength, and "gives wings" for the flight which it prompts. There are numerous examples on record of its fatal influence, when intense in degree, frequently renewed or long continued.

Anxiety, a state of mind of which fear is the predominating element, produces some of the most singular of those phenomena, which are familiarly referred to as exhibiting the close connection between the moral and physical portions of our being. The beautiful hair of the high-born Marie Antoinette, became gray in a few hours from the excess of this emotion: and the whole frame has been known to assume, in a short period, all the appearances of sudden old age.

Love, though last not least on this brief catalogue, is doubtless the most powerful of human passions, well deserving to rank among the most fruitful sources of disease, and this even, when successful and happy. It is at best but a stormy emotion, and knows no tranquillity; but when accompanied by jealousy, its ordinary attendant, nay its almost inseparable companion, that mind must be singularly well poised, and that frame robust indeed, which can withstand their concussions. Anger has been called by the Latin poet, a "brief madness"—love is more mad than anger, and unhappily is not so brief.

The *poisons*, properly so called, deserve a prominent place in this enumeration of the exciting causes of disease. The word poison may be defined to mean a substance or agent whose specific and peculiar efficiency is injurious to the health of the subject on which it acts. The degree of injury which they are capable of producing varies in each, from a transient disturbance of function to mortal prostration of vital power, or fatal organic lesion. The force with which each shall act, is liable to be modified by several contingencies, as the condition of the recipient, the amount of dose, the repetition or duration of its action. But these circumstances do not change or modify in any notable or uniform manner, the nature or kind of influence to be expected.

Our definition, it is obvious, will include the long catalogue of medicines, which all, if efficient in the production of any perceptible effect upon the body, derange some of its functions. As therefore all medicines are in this sense poisons, so some therapeutical experimenters, with Stoerk at their head, have been disposed to regard all poisons as medicines: and the speculation has been fruitful of some valuable results in the addition to our apparatus medicaminum, of several important remedies, of which prussic acid and strychnine will serve as examples. But the rule thus proposed is liable, as you will soon observe, to a very wide range of exceptions.

Poisons are usually divided according to the kingdoms of nature in which they have their origin, into vegetable, mineral, and animal;—to these I will add a fourth class—the ærial, which comprehends several important and extensively influential agents not to be arranged with definiteness under either of the other heads.

1. The vegetable poisons are numerous. Some few of them, as the upas and mancinella, act by exhalation, and reach the subject at some distance; applied to the skin they irritate severely. In this latter mode, though with very different degrees of violence, the horse radish, mustard, *rhys radicans*, *rhys vernix*, cashew nut, mannarilla, and *cerbera ahowai*, affect the surface with inflammation. Some require to be introduced into the circulation through a wound or abrasion of the cuticle. It is in this way that the terrible effects of the woorara, ticunas and other South-American and Asiatic poisons are produced, and thus the weapons

of certain savage tribes are rendered deadly. But a still greater number of vegetable substances act upon and through the medium of the mucous membrane lining the digestive tube. These you are familiar with, under the names of emetics, purgatives, etc. titles only serving to point out the modes in which they disorder the system. The more indirect effects of the diuretics and narcotics, are supposed to be accounted for, partly by a sympathetic action extended from the nerves of the surface to which they are applied, and partly also by their absorption into the mass of circulating fluid, and being carried to the organs upon which they are specifically adapted to act—the kidneys, namely, and the brain.

2. The list of mineral poisons is not very long, if we recount only those which nature offers us; but the researches of chemistry have added prodigiously to the extent of this class, by her combinations and decompositions. The pure earths, as they are styled, and the alkalies, are caustic and corrosive; so are the mineral acids generally. The metals are inert or almost harmless, until by the action of the air or of some acid, they are converted into oxydes or salts, with the exception of mercury, which in its simple volatile form seems deleterious; this is perhaps true also of arsenic. In the quicksilver mines, the workmen are considered victims, whoses places almost annually rendered vacant by death must be filled by new victims. Criminals are employed in this way, and thus expiate the guilt of murder, treason and sacrilege. The direct action of mercury is upon the salivary glands, and the neighboring tissues and the bones of the face, giving rise to ulceration, gangrene, caries and necrosis.

Arsenic, unhappily well suited to designs of evil from the minuteness of the fatal dose and the easy disguise of which it is susceptible, excites a dreadful and uncontrollable gastritis. Lead produces rachialgia and paralysis, and perhaps epilepsy. Copper is stimulant and corrosive. Antimony occasions vehement vomiting, cramps and spasms.

3. Reserving the animal poisons for future consideration, I proceed,

4. To speak of the ærial. Under this head, (which constitutes indeed a large class of agents deriving their origin promiscuously from all the sources above mentioned, the vegetable, animal and mineral kingdoms of nature,) I shall include, besides the gases,

properly so called, all the impalpable contaminations of the atmosphere, with the single exception of the contagions, which are hereafter to engage our special attention as obviously and exclusively of animal formation.

Some of the ærial poisons we may denominate chemical, as consisting or composed of elements which are known in the laboratories, and can be produced by the processes of art and detected by definite tests; others again are obscure in their nature and entirely beyond the skill of the chemist to create, detect, or destroy them, such as the various modes of miasm or malaria. From what you have learned on the subject of respiration, and the uses of atmospheric air in the animal economy, you are of course aware, that any change in the constituent principles of which this fluid is compounded, or even of their relative proportions, must be attended with dangerous consequences to those who breathe it so modified, whether the change consist in the subtraction of any of its essential ingredients, or in the addition of any new element. You will never meet, perhaps, with any accidental example of the deleterious effects of inhaling air rendered unfit for respiration by the mere superabundance of one of its own constituents, except in the instance of carbonic acid gas. Its proportion in the atmosphere is small but uniform, about one part in one hundred, but it is evolved largely from the lungs at every act of expiration. If, therefore, an animal is confined for any length of time within a limited amount of air, he will die. His death was formerly ascribed to the consumption of oxygen only, which was regarded as the vital element, but the experiments of Goodwyn prove that he will die from the directly poisonous influence of the carbonic acid, before the oxygen is so far consumed. Ordinary combustion, which you know presents many analogies with respiration, gives out also large volumes of this gas, and thus in close rooms many have died. A young man of France, the son of a celebrated chemist, chose, during the horrors of the revolution, this mode of suicide. Shutting himself up closely in his chamber, he inhaled the fumes from burning charcoal, and amused himself by writing down from time to time a record of his thoughts and sensations. Before the writing ceased to be legible, it was evident from some of the expressions, that his mind had wandered.

Since then, this has become, on the European continent, a rather fashionable mode of voluntary death. Thus perished accidentally, in 1826, two young men on board a small vessel in the harbor of New-York. They warmed their little cabin with a pan or stove of lighted charcoal, and were found next morning quite dead.

It would appear that nature in various modes, but especially by the action of plants upon the atmospheric air, evolves in her immense laboratories, considerable volumes of this gas, which by its specific gravity, is carried into mines, caverns, vaults and wells. These places thus become the scenes of fatal accidents, from the carelessness of miners and well-diggers. Certain spots have become notorious for the pouring forth of continual streams of carbonic acid, either in combination with water, as at Saratoga and Seltz, or in its free state, as at the famous Grotto del Cane, near Naples. In this recess a dog being held for a short time becomes restless, languid, and at last falls senseless. After a brief convulsion he sinks into apparent death, but if promptly removed into the fresh air revives in a few minutes.

The symptoms which affect men who descend hastily into vaults, wells, etc., resemble these. The patient falls asphyxiated, incapable of motion, insensible; his face is livid or purple; animation is entirely suspended. The best remedy seems to be the shock of cold affusion; a vein should be opened in the arm, and the blood if possible made to flow. The skin, nostrils and eyes should be stimulated by hot applications, by mustard and the vol. alkali.

To guard against accidents of this kind, it cannot be too often repeated, that previously to the descent of a workman into any deep cavity, natural or artificial, a lighted candle should be let down. If this continues to burn brightly, the air is pure enough for the purposes of respiration; if it is extinguished or grows dim, we must infer the presence of a poisonous proportion of carbonic acid gas. Quick-lime should be thrown in, in sufficient quantity to absorb while slacking the surplus amount, and the test of the burning candle re-applied until that fact is proved.

Our newspapers have lately contained the details of numerous fatal accidents from the escape of coal gas, carburetted hydrogen, into close apartments during the night, since the general substi-

tution of this mode of producing artificial light. Chambers in which gas is burnt should be specially well ventilated.

Very peculiar effects are observed to follow the inspiration of air in which there is an undue proportion of oxygen, which when undiluted is known to be a violent stimulant. The nitrous oxyde or exhilarating gas is the most familiar of these, and is very often experimented with both privately and publicly. Yet it is not always free from danger, though in the great majority productive only of a delightful and transient intoxication, during which the imagination is highly excited and the sensibilities of both mind and body rendered intensely acute. I have known it produce asphyxia with great muscular prostration, violent convulsions, spasm, irritation and inflammation of the respiratory organs. Subjects predisposed to pulmonary disease of any kind should never breathe it in the ordinary manner.

History affords us a dreadful example of the effects of continuing to respire a given volume of confined air, vitiated by successive subtractions of oxygen, and additions of carbonic acid gas, and loaded with the several effluvia given off from the surface of the body. Those of you who are not already familiar with it, will find both interest and instruction in the story as told by Smollett, or more recently by Macauley.

The English forces of Calcutta being overpowered, and the city taken by the Suba of Bengal in 1756, the garrison, to the number of one hundred and forty-six persons were all driven into a prison of about eighteen feet square, walled up to the east and south, and open only to the west by two windows strongly barred with iron. In this miserable situation, many of them being wounded, and all fatigued with hard duty, they soon sunk into a state of distraction and despair. The heat was intense, they were covered with a profuse sweat, and the air soon became poisonously infected with the effluvia from their bodies and lungs; composed doubtless of carbonic acid and ammoniacal exhalations. In their fierce struggles to approach the windows, many were trampled down and the weaker were suffocated miserably or became asphyxiated. The terrible night at length passed away, day broke and an order was sent for their release; but of one hundred and forty-six who had entered this dungeon,

so well known "as the black hole of Calcutta," no more than twenty-three survived.

This recital, so shocking to every feeling of humanity, conveys an impressive idea of the influence of extreme circumstances; but no one has hitherto taken proper pains to point out distinctly the agency of the same circumstances in a less degree and extent. Yet it is evident that they cannot be without their injurious effects upon the constitution, as found in crowded or ill ventilated apartments. Care should therefore be taken by all to avoid them, but especially by such as are predisposed to any of the numerous forms of pulmonary disease.

CHAPTER III.

MAL'ARIA.

I HAVE already taken occasion to state that certain of the aerial poisons are not, like those last spoken of, definitely cognizable by the chemist, nor capable of being produced in his laboratory by artificial combinations and decompositions. Under this head we treat of many of the miasmata of the writers of the last age—atmospheric pollutions, as they regarded them, mineral, vegetable and animal, for they considered them to derive their origin from all the kingdoms of nature.

It is first in order to discuss the febrific miasms, with whose effects all the inhabitants of hot climates and alluvial soils, wherever situated geographically, are destined to become too familiar. In all allusions to the topic of endemic disease, medical writers find themselves compelled to lay great stress upon the fact that there are large tracts of country in different sections of the world, observed from the earliest times to be subject to a particular class of maladies. The regular occurrence of such disorders at the annual return of the accustomed season, is matter of universal expectation; and the uniformity of their history is equal to that of any of the periodical movements of nature.

From a similarity of effects—for these diseases are every where the same, or very nearly identical—we infer a similarity or identity of cause; and in the inquiry as to the nature, origin and properties of this cause, we are led to investigate the question, what circumstances are found to exist in common in the several seats occupied by the endemics alluded to. The result of this inquiry has been, an agreement of opinion almost universal, as to the existence of an ærial poison, whose nature and qualities are not clearly made out, but whose influences are very easily traceable in the production of certain definite effects, and whose sources are, at least, in the majority of instances, sufficiently well known. I proceed to examine as briefly as may be, into the correctness of the received doctrines on the subject.

The term miasm (from the Greek *μιασσω*—to pollute) has been long employed in medical writings to denote, generally, those contaminations of the atmosphere surrounding us, which do not immediately affect its respirability nor destroy its power of supporting life and combustion, but which introduce a new and poisonous agent, tending to excite disease in the human system. I see no objection to the use of this ancient phrase, but it is not sufficiently explicit for our present purpose; and as the repetition of the compound terms intended to limit its meaning, *idio miasma* and *paludal* or *marsh miasma*, significant of certain notions relative to the source and nature of the agent now to be treated of, would be tedious and inconvenient, I shall prefer the modern word “Malaria”—an Italian expression compounded of a noun and its qualifying adjective, signifying literally “bad air.” It is employed by MacCulloch in his learned and valuable treatise, and has been sanctioned by almost universal usage among recent writers in every modern language.

The nature and qualities of this poisonous agent, have been of late the themes of much ingenious discussion and patient and persevering investigation; but as yet, no test has been discovered by which we may detect its presence, previously to the production of its morbid influences upon the living body. Chemists have examined with the most minute care, the constituents of the morbid atmospheres in which it has been supposed to abound. Conjectures innumerable have been offered, as to its nature and constitution. The known products of vegetable decay have

been again and again experimented with, but to no purpose. Neither by eudiometrical applications, nor by the most perfect analysis can any additional ingredient of a gaseous nature, either in a state of mere mixture or chemical combination, be detected in such air; and we therefore infer that it is not carbonic acid, nor carburetted hydrogen, nor any other of the chemical compounds that conjecture has suggested. Its want of any notable degree of self repulsion, to be mentioned hereafter, is perhaps the strongest ground for denying its gaseous nature; yet it seems reasonable to expect some further aid from chemistry in this matter, as all the irrespirable gases known to be produced in any considerable abundance by natural processes, have been suspected of constituting the characteristic ingredient in miasmatic exhalations. Both Volta and Orfila are favorable to this belief in its gaseous nature, and such is the prevailing opinion of our professional brethren of the great west, even at the present day.

We must not pass altogether without notice, the animalcular theory of malaria. Among the ancients, Lucretius, Varro and Columella maintained that the poison of marshes consisted of animalculæ invading the body through the lungs, and perhaps also through the stomach. In modern times, this hypothesis has found favor in the eyes of Leewenhœck, Kircher, and other microscopists, and was received by Linnæus; nor has it wanted defenders in our own day, of whom we may mention Holland, O'Neale and President Cooper. I have only to say concerning it, that all the facts, observations and arguments offered upon the subject, leave the evidence still deficient, and merely avail to show the possible truth of the speculation. While these authors ascribe the influences of malaria to living animalcular irritation, the late Dr. Dwight suggests the probability, that this miasmatic exhalation arises from the death and putrefaction of the immense multitudes of these minute tribes. We shall refer to this however in another place.

There may be mingled with the atmosphere many substances in a state of diffusion, which chemistry has at present no means of detecting. Such are the odoriferous particles of musk and camphor, and the delightful fragrance emitted by the gay flowers which scent the air of spring; such the minute particles of opaque matter, darkening in greater or less degree the light of

day, and tinging with peculiar hues the beams of the sun. A recent experimenter, it is affirmed, has at last succeeded in procuring a peculiar deposit from the dewy air of insalubrious places. Boussingault has exhibited a blackish matter in small quantity, which he collects by exposure of plates of glass, through the night, in atmospheres of known foulness. If this dark matter be the poison of malaria, this point should be tested if possible, pathologically, as also the chemical constitution of the deposit. When treating of its effects, it will be more in order than in the present relation, to speak of the inferred qualities of this poisonous agent.

I have already said that it is from the similarity of these effects that we deduce the presence and identity of a common cause efficient in their production. Peculiar forms of fever, for example, precisely resembling each other in their modes of access, their type, their history, their various degrees of malignity under known circumstances, and the morbid changes they impress upon the several organs of the body, are observed to be endemic in many districts of the inhabited globe. The same description will apply to the fevers of our wide continent, whether on the margins of our great rivers or our interior lakes, upon the swamps of the Atlantic coast or our rich rice fields, and those of the fens of Lincolnshire in England, of Carthagena in South America, of Corunna in Spain, those of Savoy, and the fertile plains of Lombardy and of Walcheren in the Netherlands. For this, Batavia in the island of Java, has been called the grave of strangers. By this, the prospects of African colonization are delayed, and Liberia and Sierra Leone decimated. It is this, which renders British dominion in the Indies so expensive in European life. To this, is owing the comparative desolation of the ancient mistress of the world—the queen of nations—the eternal city. The malaria arising from the whole surface of the surrounding country,—the solitary campagna, and the Pontine marshes, annually extends its encroachments through her streets and noble squares, and threatens the entire depopulation of her seven hills.

It will be noticed, that in a large majority of the situations which I have thus hastily enumerated, a great abundance of water forms a striking feature of the region, and hence it has been supposed that the mere presence of an undue quantity of

moisture is sufficient to account for all the phenomena. This was, indeed, the prevailing doctrine before the time of Lancisi, to whose philosophical mind we must ascribe the establishment of the opinions at present received. The old notions have lately been revived and are maintained ingeniously enough by a few writers. A brief reply will suffice.

These fevers are not exclusively confined to moist situations. It is easy to enumerate many instances of their occurrence in arid and elevated districts. In Italy they prevail on several elevated ridges; at Civita Castellana; on the summit of the Radicofani, as well as in the marshes of Mantua, and about the Venetian lagunes.

Dr. Ferguson, formerly of the British army, whose statements are confirmed by Brown, declares that "he saw remittents and intermittents become epidemic in Dutch Brabant, in the encampments of Rosendaal and Oosterhout, upon level plains of sand, with a perfectly dry surface." He speaks "of villages in Spain, near the confines of Portugal, upon the banks of the Tagus and Alagon, pure and limpid streams, running through a rocky sandy district, so unhealthy during the autumnal months, that every person makes his escape who has the means; and even horses and other domestic animals are removed for fear of fever. One of these villages he describes as the most parched spot he ever saw; the loose dry sand actually obstructing the doors and windows of the houses." Farther—it is not during the rains that the malignant fevers of Africa arise. On the banks of the Indian rivers in Burmah and Siam, those have the best chance of evading the jungle fevers, who live in houses built in the water upon piles, and approachable only in boats. Among the bayous of lower Louisiana, Dr. Cartwright affirms the entire absence of malaria fevers. If he is right in attributing their salubrity, as he does, to the presence of the jussieuia, still this leaves the argument against their aqueous origin untouched; for although this vegetable may produce an agency counteractive of a specific poison, as it has no tendency to diminish the amount of atmospheric moisture, it cannot prevent diseases derivable from that source alone.

In our own district of country it is not always the immediate vicinity of the lake, mill-pond or river that suffers most. Those

dwelling in the valley or on the river bottom often escape, while the residents on the hills or bluffs adjoining suffer. But no one can imagine the higher air to be more imbued with moisture than the lower strata. Besides this, the amount of water spread over the surface of our country, is undoubtedly decreasing in a perceptible degree with the clearing of our forests; nay it is asserted, and seems to be sustainable by proof, that every where as far as observation extends, the quantity of water is becoming proportionally less, whether we regard the stagnant masses or the currents of rivers. Now, so far from the diminution of moisture being followed by any alleviation of the evils we have attributed to malaria, we cannot shut our eyes to their regularly progressive increase. The trim avenues, and well built mansions, scattered over the face of our low country by the several generations of our predecessors, may be seen in the majority of instances, fast falling to decay—the period of safe residence in them having become obviously shortened. The middle districts of our state have undergone a striking change for the worse. Many spots formerly resorted to by the inhabitants of our city and the low country generally, are now abandoned or nearly so. Some of the beautiful country seats in the neighborhood of Philadelphia, are, for this cause, deserted; and the physicians of Massachusetts and Connecticut tell us, that intermittent fever is gradually extending its limits farther north, and still seems disposed to progress, attacking one neighborhood after another. These are facts which it is impossible to reconcile with the doctrine which ascribes all this class of maladies to the influence of moisture alone, and not a specific poison, and it is upon facts like these that Ferguson has based the novel and contrasted theory “that one condition only, is necessary to the production of febrile miasm or malaria, and that is—paucity of water where it has previously and recently abounded.” Paucity of water, however, can never be predicated of our inexhaustible swamps or of the Indian jungles, so that these views are quite as untenable as those for which they are substituted.

With respect to the inquiry, whether salt marshes are as injurious as fresh swamps, I would incline to the negative reply, notwithstanding the experiments and opinions of Sir John Pringle. The venerable Robert Jackson tells us, that “the usual

endemic of warm climates is less frequent and formidable on the banks of rivers after their waters become mixed with those of the sea, than before this has happened." The experience and observation of our own Southern country confirm this view and speak loudly in favor of our sea-shore settlements, as Sullivan's island, Eding's bay, etc. It is not to be denied, that the troops in garrison at Fort Moultrie have been as healthy as those at any other military station in the United States.

It is a curious question, but one of great difficulty, whether there is any difference between the results of the decomposition of different vegetables. Some strong statements, and ingenious speculations, have been offered to prove that there is such a difference. The plants which have been pointed out as most injurious, are those which grow most luxuriantly in damp, rich soils, and those which contain most succulent juices. The white or Caucasian race cannot, in any portion of the globe, cultivate rice with impunity. The recent report made by a committee of Italian savans at Lucca, is decisive on this subject. The rotting of flax and the steeping of indigo are rather less dangerous, yet still notably so. These agricultural products all require for their perfection and preparation much moisture. Few observations seem to have been made by physicians in reference to these details, and yet it is thus only that we can learn definitely any thing. They are surely worthy of more attention than they have yet obtained.

The generally received opinion or doctrine among medical writers is, that the febrific poison, known as malaria, is the product of vegetable decay or disorganization, a notion expressed in the common phrase marsh miasm, and a great mass of facts may be adduced in its support. A high temperature with moisture, not only favors the rapid and extensive growth of vegetables, but hastens their maturity and fosters their decomposition. In hot, moist and fertile districts of country, then, we should find the greatest intensity of malaria influence, and observe most frequently its effect upon the human system.

I need not remind you that such is, indeed, the fact, and that many of the finest portions of the earth's surface, vast tracts of the most productive soil, the best calculated for supplying man with food, are thus rendered almost or absolutely uninhabitable by the

higher races—the thick and clustering vegetation thrown forth in such spots serving only as a den for wild beasts or inferior and savage tribes, and a shelter for venomous reptiles.

From this cause, either wholly or in part, authors derive the existence of most of the dreadful forms of fever. Both yellow fever and the plague are supposed to be developed under its influence, combined with other agencies, not well made out. We find the intensity or malignancy of the diseases produced by it, very directly proportioned to the degree and permanency of the heat of the locality affected. Thus, in low latitudes, besides the terrible forms of pestilence just mentioned, we have malignant remittents and intermittents, of great proportional mortality, and violent dysenteries and acute hepatic disorders. As we proceed northwardly, we encounter the less severe remittents and intermittents, chronic hepatitis and splenitis and dropsy. Now it is a very striking circumstance, that we can often trace these diseases to narrow and limited sources, where no special condition is present but the obvious putrefaction of vegetable matter, which seems indeed to prove the evolution of the marsh poison malaria, as well in the confined air of a fruit or potato cellar, and in the dirty hold of an ill-ventilated ship, as in the neighborhood of a mill-pond, or pervading the atmosphere of Egypt, on the subsidence of the sacred river.

In a perfectly dry air, vegetable decomposition is arrested, or proceeds with extreme slowness and in a peculiar manner. Cold also retards the process, and when it reaches the freezing point, altogether prevents it. During even the mildest winters, the changes of decay must go on very slowly, and the comparatively small amount of effluvia given forth from time to time, diffused widely through the air and largely diluted. During the reign of frost the agriculturists of our low alluvial country, think themselves safe from the ravage of miasmatic pestilence. Released from their summer residences at the commencement of winter, they remain upon their plantations until the return of spring, whose balmy zephyrs waft us on their soft warm wings the elements of destruction. I do not know that fruit ripens with us earlier than in years past, nor is there any proof of a more rapid precession of the seasons, or of the abbreviation of our winters. Yet it is certain that the period of annual return of our endemic

fever has undergone a notable anticipation. Planters in the olden time remained, they tell us, safely among the rice fields until June or July. It is now attended with some danger to delay their removal later than the beginning of May—nay I have seen cases brought on from exposure in the latter part of April. These facts are not easily accounted for.

In a new country, to use an American phrase, the upper stratum of soil is composed of the remains of leaves from the forest-branches which from time immemorial have overhung and shaded it, and of the shrubs and weeds which have flourished and died in successive generations upon it. The clearing then, of such land, must expose to the direct rays of the sun an immense amount of miasmatic material, and occasion a rapid and abundant evolution of the noxious principle. Thus our early settlers, the pioneers of our migratory population, are exceedingly liable to fever, as if the genius of our ancient forests were determined to avenge the invasion of his long undisturbed and solitary domain. This layer of vegetable soil being superficial, and on the uplands of no great depth, is in no very long time destroyed, and such positions become free from disease. But there are alluvial lands, such as our river bottoms and rice fields, formed to indefinite depths of such vegetable mould; here the quantity of material being absolutely inexhaustible, the generation of malaria will progress interminably, and these localities will be forever unfriendly to the constitution of the white race. It should be remarked, that although partial clearing must, as has been said, increase, at least for a time, the insalubrity of the climate, yet the entire removal ultimately of the vast masses of wood which still cover the face of our country, besides cutting off the farther supply of material, will, by permitting free circulation of air and agitation of winds, occasion a diffusion of the malaria developed, and dilute away much of its noxious influence.

This question of "dilution" has, however, been seriously argued by some writers, (vide MacCulloch) who maintain the capacity of indefinitely small portions of malaria to produce the most intense results. This is a gross error. A distinction has been offered by sounder pathologists, between a virus and a poison, on this ground, that the smallest effective amount of the former, as the matter of small pox contagion for example,

will produce in the system which it affects, all the changes which follow the introduction of the largest possible quantity, while on the other hand, the effects of all poisons differ according to the dose administered, and may thus be regularly graduated. But it must not be forgotten that they may both be diluted to absolute inertness.

The influence of moisture in promoting the development of the diseases attributed to malaria, is undeniable, and seems to be two-fold. Besides fostering the decay of vegetable matter, it appears to enter into intimate union with the noxious agent, perhaps effecting indeed, an actual solution of it. Fogs have in all ages and among almost all nations, by the vulgar, by poets, and by philosophers, been considered as either insalubrious in themselves, or as the medium of conveying miasmatic principles diffused in the atmosphere. They are not in themselves febrile, for they are frequent in many regions where malaria fevers are unknown, as over the rivers of New-England, the peat bogs of Ireland, the Scotch lakes, and the mountainous table lands of our own country. But in miasmatic districts it is matter of constant observation, that the period at which fogs rise into the atmosphere and condense from it, are the most dangerous to those exposed. The hour after sun-set and the hour preceding sun-rise are, on this account, to be avoided—so indeed, is the whole time during which dews are falling. The night is a much more perilous season than the day, the least risk being supposed to exist at noon, when the aqueous exhalations are carried up into the higher atmosphere by the heat of the vertical sun.

The influence of different seasons upon the salubrity of miasmatic regions, is analogous to what has been stated. A very dry summer and spring are apt to be healthy. A very rainy season produces a like effect, by covering the whole surface of noxious material. Heat, air and moisture are equally necessary to the miasmatic decay of organized vegetable matter, which may or may not be identical with offensive putrefaction, but which certainly depends upon the same efficient elements. Thus it happens that in very wet autumns the higher grounds, even the sides of hills and mountains, share the evils which in ordinary and dry years are confined to the vallies, water courses and alluvial

plains. I do not pretend to affirm that these remarks are of universal or exclusive application. There are, I acknowledge, many exceptions, but long experience has established their correctness as general rules.

In a similar way we explain the immediate effect of rains. If these are heavy and large, they combine with, bring to the earth, and carry off in solution the atmospheric effluvia, washing away in their course also, much of the soft, loose, decaying vegetable surface. Slight showers, on the other hand, falling on the hot soil, are promptly evaporated, and rise again into the air in the shapes of fog and vapor, bearing on their damp wings dense masses of pestiferous exhalations.

The action of the electric fluid upon febrific miasm is not well understood. A general opinion has prevailed from time immemorial, that its agency is highly salutary, whether by any purifying effect upon the atmosphere, or by a beneficial influence exerted upon the human constitution. Electricity may act in both these modes; yet the notions entertained on the subject are as yet altogether hypothetical. It must not be forgotten that thunder storms, always esteemed so salubrious, are attended with great agitation of the air and wide tumult of the elements. If good result from these concussions of the tempest, we must not attribute it exclusively to the forked lightnings. Winds disperse the foul mephitic effluvia which "pollute the sky," and driving them forward with infinite force and rapidity, diffuse them through space, and extinguish their malignant activity by destroying the concentration upon which depends their virulence. Calms, by favoring this concentration, give to all ærial poisons an indefinite intensity, as has been noted, from the plague of Athens down to the present time. Hence we find the sufferers in cities devoted to every form of pestilence, endeavoring with all the energy of despair, to set in motion currents of air by artificial means—by gloomy fires kept burning in the desolate streets, by the explosion of artillery, and the combustion of large masses of gunpowder.

It would be improper to pass here, without notice, some of the objections that have been made to the exclusive vegetable origin of malaria. It is undeniably true, as has been stated, that we find this febrific miasm existing in a state of powerful con-

centration, and exerting its deadly influences wherever marshes, bogs, etc., are spread out under a hot sun; it is alleged, however, that its presence is also ascertained unequivocally in situations where this combination of circumstances does not occur. "The malaria of Italy," says an American writer of respectability, "is found in very different situations, situations indeed, so different, that we can scarcely be justified in believing it always to proceed from the same cause." It is indeed, certain, that many of the districts subject to malaria fevers do not present the peculiarities which we have hitherto been considering as connected with, or concerned in the development of this noxious effluvium. The Campagna di Roma, deserted for its insalubrity, except by the herdsman and his flock, "is a territory entirely of volcanic formation, broken into gentle undulations, quite dry," and elevated considerably above the level of the sea. The vegetation upon its surface is by no means abundant. In a great number of instances the sites of old, extinct volcanoes, are peculiarly unhealthy. Such is the fact with regard to Boccano, a solitary post-house about twenty miles from Rome, situated in a sort of valley, perhaps the very crater of an extinguished volcano.

In June, 1826, I found more malaria fevers prevailing at Civita Castellana—until lately regarded as the ancient Veii—than in any other part of Italy, the pontine marshes not excepted. This town is situated on a high hill, or rather mountain of volcanic formation. The surrounding rocks are disintegrated, soft, and porous, insomuch that the shepherds have in many places made extensive excavations in the hill sides, sufficiently large to receive considerable flocks of sheep. There can be no stagnant water in its environs, from the nature of this loose tufa, as well as from the broken abruptness of the face of the country, which presents in its rude outlines some resemblance to certain parts of Scotland. You enter the gate of the town by a bridge crossing a glen or ravine more than one hundred feet in depth, down which a mountain stream rolls its ever-varying torrent. From our very inn-keeper we received an honest warning of the danger of remaining there a single night, and were urged to proceed, with the emphatic declaration, that "every body in town had the fever."

Emerson, in his "Letters from the Egean," gives us some analo-

gous statements. "The town of Milo," he says, "is situated, like almost all those of the Levant, on a conical acclivity, towards the summit of which its narrow streets stretch up with a precipitancy much more conducive to cleanliness than to convenience. The climate of the Milots is one of the most noxious in the Levant, and their soil being volcanic, is still boiling and fermenting with intestine fires, and constantly emitting the most unwholesome vapors and deadly miasmata. On this account, they have, by degrees, deserted the former town, which stands near the shores of the harbor, and retired to the more lofty situations and the mount I have mentioned, and even this latter is now becoming gradually unhealthy and deserted. The porous rocks of the hills have been hollowed out, like those of Antiphyllus, into numerous catacombs, but now occupied chiefly as sheepfolds by the peasantry."

These facts are, by some writers, regarded as giving foundation for a reasonable belief, that the volcanic remains of positions like those alluded to, may, at a certain point of decay and disintegration, evolve a febrific miasm, either similar to or identical with paludal malaria.

It is well to note, in a definite way, before we proceed farther in this discussion, what are the alleged effects of malaria upon the human constitution. The list of diseases attributed to it by different writers, is, indeed, a long and diversified one; but we shall have occasion to comment, as we go on, upon some strange mistakes and exaggerations. Cholera, plague and yellow fever have been too hastily set down on this catalogue, as I shall show in the proper place. Typhus fever is more plausibly derived from this source, yet, for my own part, I would not ascribe to malaria alone, any form of continued fever. Remittents and intermittents are the most familiar and characteristic consequences of exposure to its action. Neuralgia, in several of its ill defined varieties, is placed here by MacCulloch and others. With as good reason, we may add cretinism and goitre. Dysentery is almost universally considered under this head. Hepatitis and dropsy I am disposed to regard rather as secondary than immediate or direct effects of its action. Dr. MacCulloch gives us the following appalling catalogue of malaria diseases:—"Fever, continuous or remitting, of an endless diversity of character;

intermitting fever, almost equally various in its appearances; dysentery; cholera; diarrhœa; apoplexy; palsy; visceral obstructions and dropsy; the mesenteric affection; worms; ulcers of the legs; elephantiasis; rickets; scrofula; phthisis; scurvy and chlorosis; the pellagra of the Italian Alps;" and even "goitre and cretinage" are mentioned here with "hernia and varix; angina; catarrh reaching to peripneumony; asthma; dyspepsia of an inveterate character; and œdema of the lungs." He, then, goes on to "propose a large addition in the disorders which he has ranked under the term neuralgia," which, indeed, he has made to comprise almost all the remaining "ills that flesh is heir to," "such as sciatica, toothache, headache, other painful or nervous affections,"—a very sweeping phrase, by the bye,—“and, finally! fatuity and even mania.”

Among the most striking exaggerations into which half informed writers on this subject have fallen, is the statement which they make as to the influence of malaria upon both the *average* and extreme duration of life. Assuming the mean term of life in England at forty-five years, it has been calculated, in some malaria districts, at not more than 25-22-18. MacCulloch, and after him, Brown, a recent writer in the English Cyclopædia of Practical Medicine, have rated the extreme term of life in Egypt, and in Georgia and Virginia as not exceeding forty. We cannot but smile at the total ignorance of geography and statistics exhibited in such assertions; but the error should not go uncontradicted. In a table of the deaths occurring in Charleston from 1820 to 1827 inclusive, there are 2,181 recorded of persons *above forty* years of age, being nearly one-third of the whole amount for that period, 6,953, thirty-one being upwards of a hundred, and two above 110. Yet, I am sure, that the inhabitants of the country included within the limits meant by these writers, when they speak of Georgia and Virginia, would be unwilling that our city should be taken as their standard of salubrity. I am inclined to think, that our average duration or mean term of life approaches very nearly, as, indeed, might be inferred from the table given, to the point they have set down as the extreme; at any rate, I would place it above thirty-five.

The venerable Robert Jackson affirms, in his treatise on fever, that at Petersburg, Va., a native rarely reaches twenty-one. He

passed through that town during the revolutionary war, when, probably, all its adults were in the field with Lee or Washington, and when, indeed, it had scarcely been settled long enough to give more than twenty years to an infant born there.*

In all malaria countries the mean term of life of females is beyond that of males, on account of the greater risks to be encountered, labor to be performed, and exposure to be gone through in the prosecution of all active occupations.

Another important point to be determined, is the influence of malaria upon the fertility of our species. It would, at first view, seem reasonable to anticipate an indirect diminution of the number of births in a country subject to malaria on account of the individual sufferings from attacks of disease, yet this effect is not noticeable. In some of the villages beyond Rome, on the road to Naples, Fondi and Itri for example, in the midst of a region, where the delay of a single night in the warm months, is at the utmost risk of the stranger's life, children throng the streets in such crowds that the most careful driver can scarcely avoid crushing them. In the absence—doubtless to be regretted—of any statistical details on the subject, *we* should laugh at any one who would rate the average fertility of marriages in our own Southern country at less than seven or eight. This, though a conjectural estimate, is probably little, if at all exaggerated.

It has been much disputed, whether malaria, in producing its effects upon the body, acts primarily upon the skin, the lungs or the stomach. The favorite opinion among the physicians of America has been, that it acts almost exclusively upon the internal surface of the stomach, being mingled with the saliva and swallowed. Hence, the habit of eating previously to unavoidable exposure, and of smoking tobacco while exposed, in the latter of which practices great confidence is placed by many. In Europe, on the other hand, a majority sustain the doctrine of pulmonary inhalation, and believe the lungs to afford the chief inlet of all

* There has just been published, February, 1839, a notice of the death of Mr. Bolling, aged seventy-nine—"the first white person born in the town of Petersburg." Mr. Bolling could not have been more than eighteen years of age when Jackson visited Petersburg. No better comment than this can be offered upon the crude and careless statements too often made by the best and most authoritative writers.

ærial poisons. I will not deny the possibility of the admission of malaria into the system in each of these modes, yet, I think it indicated by a variety of circumstances, that the skin is, for the most part, affected primarily by this deleterious agent.

We find the state of sleep especially adapted to receive the impression of miasmatic diseases. In all unhealthy countries you are cautioned against sleeping while exposed to the noxious exhalations. The postilion, as he drives you with dizzy rapidity through the Pontine marshes, shouts to you to rouse yourself and sit up; while all travellers have felt that this foul atmosphere is full of drowsy and soporific dispositions, and that the most vehement resolution can scarce resist the temptation to indulge in slumber. Universal experience has proved the danger of sleeping in such situations; but, in sleep, little or no saliva is swallowed, while the skin and lungs continue engaged in their functions of absorption and transpiration.

The principal argument, however, in favor of the cutaneous admission of malaria, is drawn from the exemption enjoyed by the lower races of man, and by the inferior animals, from diseases originating in this source. I state the rule here broadly—there are, doubtless, certain exceptions, but these, I think, can be explained without difficulty.

In no respect, is the physical difference between the white or Caucassian man and his brethren of the red and black tribes more prominent than in the degrees of their susceptibility to the action of this febrific miasm. The negro constitution, indeed, approaches nearer that of the lower animals than of the white man. He delights in the hot and steaming plains of Africa, and exults in full health and vigor amidst swamps and cane-brakes whose lightest breath is destruction to the European. Without his aid, our rice fields must forever remain uncultivated, and the whole of our fertile low country become again a wilderness.

Thus, also, it is only by the exacted civil and military services of the dark natives of Hindostan that the Englishman lives, moves and has his being in that unfriendly climate, from a brief contest with which, he almost always retires pale, sallow and languid, with worn out forces and a shattered constitution. Thus—to return again to our own country—thus it is that the wily savage, taking shelter in the deadly recesses of our South-

ern morasses and everglades, bids defiance to the utmost efforts of civilization and military science; foiled not by his skill or courage, but by the pestilential influences of his ærial ally.

MacCulloch is inclined to rank among the diseases produced by malaria, the epizootics or epidemic ailments which occasionally affect the denizens of the fields and the air, and even those which from time to time destroy in vast numbers the fish of particular localities. He tells us of a canine case of regular intermittent. Ferguson remarks that the inhabitants of some of the Spanish villages remove their horses and other domestic animals for fear of fever. Rush and others have affirmed the mortality of cats in the northern cities during the prevalence of yellow fever. Perlee tells us, that during one of the invasions of that disease, in Natchez, domestic animals suffered, and even the wild deer of the neighboring forests seemed infected. Sir James Fellowes states, that in Gibraltar, in 1820, canary birds died in great numbers with blood issuing from their bills, and that the sparrow tribe was almost exterminated. I do not know that it is relevant here to add, that during a season of unprecedented mortality from yellow fever in New-Orleans, the fish are stated by the newspapers to have perished in vast multitudes in the waters of the vicinity.

Upon all this I would remark, first, that I have already denied that yellow fever is a malarious disease. I shall in the proper place endeavor to show, that although malaria is probably one of the elements essential to its generation, yet the presence of some unknown but pestilential agent must be superadded, before the disease is developed. That this undefined poison may be injurious to animal life generally, I will not gainsay. Secondly, I disbelieve altogether the influence of malaria upon animals of the lower orders. The only distinct case recorded, is that of tertian in a dog, to which I attach no weight whatever. As this anomalous fact is single, I shall not doubt its correctness, nor impugn the authority upon which it rests, but content myself with regarding it as an instance of unintelligible periodicity.

Amidst the rank grass of Africa, the lion couches, and her forests resound with the roar of her beasts of prey. The jungles of India nourish the elephant and the tiger, and the thick foliage shelters innumerable tribes of apes and serpents. In the swamps

and bays of America, the panther and the wild cat seek their food, and the deer hides himself from the red Indian and the hunter. Animal as well as vegetable life, luxuriates in heat and moisture; hosts of reptiles crawl abroad in the mud of each slimy pool, and countless insects sport in every sunbeam that glances from its surface. To man—to the white man alone, is this prolific combination unfriendly.

But the structure and functions of the lungs and stomach are not obviously different in the black, or red, or tawney tribes; like the lower animals, they are chiefly distinguished from us anatomically and physiologically, by the peculiarities of the cutaneous integument. We account then, most readily, for their remarkable difference as to susceptibility of malaria impression, by reference to the structure of the skin, which would therefore seem to be the surface primarily acted on.

It is true that negroes born and constantly resident in healthy positions, who have been housed and clothed delicately, will become in a certain limited degree susceptible of miasmatic influences. It is possible, too, that animals long domesticated and carefully sheltered and tended, may take on a like susceptibility, though this is not well established. In this part of the world, where we have but too familiar an acquaintance with this subject, we are persuaded that our negroes are comparatively little—our flocks and herds not at all liable, to malaria diseases.

If the advocates of pulmonary inhalation, should press us with the apocryphal stories told of the protection afforded by breathing through a silk handkerchief or a folded mantle; or the gastric pathologists urge upon us the proverbial advantage of occupying the stomach with ardent spirits, wine or food, and of chewing and smoking tobacco, it is easy to reply, that there is abundant and equally weighty evidence to establish the preventive influence of oil applied over the cutaneous surface, and of the greater safety enjoyed by those who wear, as in ancient times, their woollen garments throughout the summer.

A certain period of time, varying under various circumstances, elapses between the efficient application of malaria to the surfaces of the exposed body, and the development of its specific morbid consequences. The length of this latent period has a definite relation, as well to the intensity or concentration of the poison,

as to the predisposition of the individual affected. Lind says, that he has "seen a whole boat's crew that had delayed on shore till the setting in of night, seized with bad fevers the next morning." Ferguson tell us, that "the atmosphere of certain marshes of Antigua was so actively pestiferous, that soldiers mounting the night guard were not unfrequently taken ill while standing sentry, and expired with all the horrors of black vomit within less than thirty hours from the attack."

In the opposite extreme are the cases affirmed, (*vide* Bancroft,) to have occurred among the survivors of the fatal Walcheren expedition, as long as four and six months after their return to England.

My observations, in reference to our own country, appear to me to confirm the remark of Robert Jackson, that attacks follow rather at septenary periods in preference—the seventh, fourteenth and twenty-first days after efficient exposure. Beyond this last, we are apt to consider ourselves safe. The most severe and protracted case of this kind which I ever saw recover, was seized on the twenty-first day after his return from the country with a very slight chill. The next day fever came on with great violence and was protracted seven weeks.

The circumstances which favor the influences of malaria upon the body, are next to be noticed. Besides the condition of sleep already spoken of, great fatigue, want of food of sufficiently nourishing or stimulating character, languor and debility indeed from any cause, bring the system into a state of notable predisposition. Heat not only aids in the production of the nervous agent, but by its relaxing and exhausting effect when long continued, prepares the constitution to be acted on by it. It is alleged also to assist in the excitement of some of the most injurious consequences, by its characteristic impression upon the hepatic and cutaneous vessels. After this it may seem strange to say that alternations of temperature are more dangerous still, yet such is the fact. Our fevers are more rife, and most malignant in September and October, when the nights are cool, after hot days, and abundant dews settle upon the earth in the evening, and fogs rise dark and heavy in the morning—the constitution being agitated by these rapid changes, and the frame prostrated by alternate constriction and relaxation. It is to this

alternation that I would ascribe the long observed severity of our earlier and later attacks, on account of which some planters prefer continuing to reside in the low country until June, rather than run the risk of a removal in May—for as it is next in order to remark, it is supposed to increase the liability to attack, whenever an exposed subject undergoes a change of residence. The fact I think is fully made out, but it is not easy to explain it satisfactorily. Farther it is not only alleged that one who has remained within a malaria district long enough to become affected by its influences, is more likely to be attacked by fever if he remove thence or change the air, as the phrase is, but it is also abundantly proved that the consequent attack will by such change be rendered far more serious and even malignant. .

In truth, the effect of habitual exposure, by continuous residence in such districts, is much more obvious in the diminution of the violence or intensity of the effects of this poison than in protecting against the repetition of these effects. I have known many inhabitants of our lower country who have scarcely passed in their whole lives a summer and autumn exempt from fever. These persons generally suffer from the more protracted forms of intermittents, while a stranger would die at once or recover with difficulty from an inflammatory or congestive remittent. Nor indeed have the former much cause for exultation. Visceral obstructions—intestinal, splenic, and hepatic supervene, and they often sink slowly into the grave, the worn-out victims of anasarca or ascites. “How do you live here?” asked a traveller of the wretched inhabitant of such a country. “We do not live”—was the gloomy response—“we die.”

A low and flat position favors the action of malaria, as a long the margin of a slow moving river, or at the bottom of a valley, or on a wide alluvial plain. Hence it has been very fairly inferred that the particles or atoms of febrific miasm possess a degree of specific gravity considerably greater than that of atmospheric air. An elevation of but a few feet from the surface of the ground often makes a notable difference. A house four feet above the earth is less infested, other things being equal, than one whose floor is level with the soil, or less raised. The lower stories of a house in a foul atmosphere are more unhealthy than the upper chambers. Some have attempted to measure with exactness the

height to which malaria may rise in the air. Humboldt observes, that "the farm of Encero, situated above Vera Cruz, is a stranger to the insalubrity that reigns over the whole coast; the elevation of this farm is 3,045 feet." Rigaud de l'Isle considers the limit to vary between 682 and 1,000 feet above the source of the exhalation. In regard to this matter, however, we frequently meet with exceptions and irregularities, some of which are not easily explained, others we refer to the course and force of winds, and to the wetness or dryness of seasons.

The affinity of malaria for moisture has been already spoken of. I look upon this affinity to be so absolute, essential and exclusive in its influence, that malaria, if it were possible to prepare it in a dry state, would be totally inert and harmless. Now, as far as moisture may be carried up into the thinner regions of the atmosphere, in any notable degree of density, so far may also malaria rise upward, retaining its noxious powers; but beyond a certain extent of diffusion, dilution or dispersion of the vapor with which it is combined, it loses that concentration which we formerly maintained to be necessary to its poisonous operation.

Although I do not impugn the doctrine which attributes weight to malaria, yet this seems to me the true advantage of elevation; not that the miasm cannot reach a lofty point, but that of necessity it becomes, while rising, less and less concentrated, and that the chances of its dispersion are infinitely multiplied. It is also in the less dangerous hours of mid-day that the noxious vapors are carried into the upper air; they are copiously precipitated at sun-set and during the night, and then abound in the lower strata near the earth's surface, in valleys and depressed situations.

I have already observed that malaria seems destitute of the quality of self-repulsion, and hence argued that it is probably not a gas. In a great many instances on record, it has failed to affect persons exposed at but a short distance from its obvious source. You will find in Bancroft a collection of such examples. In the history of the Walcheren expedition it is affirmed that the crews of some ships anchored even within one-fourth of a mile of the coast, continued healthy, while every man who had gone on shore was seized with fever.

The same statement is more than once repeated in the writings of West Indian physicians. MacCulloch tells us that on

one side of the Kent road from London, the houses are healthy, and on the opposite are affected with fever; and it would be easy to furnish similar facts from every part of our own malaria country.

As this poison thus seems entirely dependent for its spread and conveyance upon adventitious circumstances, it will be well to ascertain what these are, and their actual efficiency. It is capable without doubt of being wafted by winds to some considerable distance, though this has been much exaggerated. The eastern shores of our rivers and lakes, and the eastern borders of our morasses, are more sickly than the opposite, on account of the general prevalence of mild westerly breezes during our summer and autumn.

Where malaria fevers occur at a distance from any very obvious source, as Rush has ascribed them to the effect of winds conveying the poison not less than thirty or forty miles, we shall probably by careful examination, detect on the spot some lurking material from which it is evolved. I have alluded to the productive power of small masses of vegetable matter, as in wet cellars, ill ventilated dirty vessels, shaded yards, or ill-drained and ill-cleaned lots. Attention should also be paid to the subsoil; this may be of such a nature, clayey and tenacious, as will not allow the percolation of water, which becomes stagnant and putrescent.

In the progress of malaria from its source, much has been said of its liability to be impeded by certain alleged obstacles. The interposition of a forest, a mountain, a high wall, a tent-cloth; nay, of a cloak, a mantle, a gauze pavilion, a veil, a silk handkerchief, has been supposed competent to preserve us from the pernicious effects of air charged with this effluvium. Assuming the correctness of the facts stated on this subject, I am by no means satisfied with the explanations hitherto offered. The mechanical passage of miasmatic atoms cannot surely be difficult through apertures which admit air and odors. Nor can I understand the nature of the chemical change which some suppose to be effected within some of these barriers, by the exhalations from the skin and lungs, collected there, upon the malaria which penetrates within the gauze pavilion, the veil and the silk handkerchief. Let us refer once more to the doctrine of the absolute

necessity of its solution or combination with moisture. A heavy vapor thus noxiously impregnated, will find a mechanical obstacle in a high wall, if borne from its source by a gentle night breeze ; if by a strong one, it will be carried over to be sure, but dispersed and diffused, and therefore with loss of concentration and intensity. Dense moist air will not easily pass through a thick canvass or tent-cloth, which thus gives a certain degree of protection. Fires kept burning in an apartment, tend to keep the air within warm and dry. By raising its temperature, its power of dissolving moisture is increased ; admit moist and chilly night air charged with miasm into such a chamber, and the immediate solution of its moisture will precipitate the malaria, now left unsustained by its ally, in an inert, dry state ; or if the affinity be too tenacious to be thus destroyed, will lessen its concentration materially. It is thus I would account for the immunity of the charcoal burner of de l'Isle and others under similar circumstances, and for the attribution of protective power to Venetian blinds and gauze pavilions. The cloak or mantle I look upon as a very efficient protection, and with Brocchi, would lay great stress upon the preference due to woolen garments, to the universal use of which among the lower classes of the Romans, he ascribes the comparative immunity they enjoyed in a climate since become so insalubrious to their descendants.

It is an old notion that the foliage of trees has great efficacy as a defence against malaria, and facts might be given you from Pliny, Varro, Lancisi, Volney, Rush and Johnson, to establish this point. Some consider the obstacle as merely a mechanical one, while others suppose that the deleterious effluvium possesses some inherent and peculiar property, by reason of which it is attracted by, and adheres to such foliage. Both of these suggestions are probably correct, for the leaves of trees attract dews and vapor, and of course the malaria dissolved in them. This, however, is not all. Every kind of tree will offer a mechanical impediment to the passage of air carrying malaria ; any foliage will condense the moisture with which it is combined ; but it is not the densest forest growth, nor the broadest and thickest foliage which is most efficiently protective. The pine, with its tall columnar trunk, elevated branches and linear leaves, opposes

less mechanical obstacle to the transmission of air, and less surface for the concentration of dews and vapors than any other of the trees of the wood, and yet seems gifted with singularly salubrious powers, and imbued with healing and preserving virtue in every bough. Every tree circulates its peculiar fluids, and secretes and eliminates its specific and peculiar effluvia; it does not appear to me unreasonable to believe, that certain of these exhalations may possess chemical properties and affinities enabling them to combine with, and decompose or neutralize malaria, or the elements which constitute this poison.

Dr. S. A. Cartwright, of Natchez, Miss., as already mentioned, strongly contends for the "hygienic or health-preserving properties of the *jussieua grandiflora* or floating plant of the bayous and lakes of lower Louisiana." He ascribes to its presence and specific qualities "the remarkable exemption of the inhabitants of that section of Louisiana from malarious or miasmatic diseases." He affirms, too, "that it purifies all stagnant water in which it grows—that of the lakes and bayous inhabited by this plant being as pure to the sight, taste and smell, as if it had just fallen from the clouds." "The fact," he says, "that the region of country in which this aquatic plant abounds, is exceedingly healthy, can be established beyond cavil or dispute. It nevertheless contains more stagnant water and swamps than any other inhabited district, of the same extent, in the United States."

It is to the several circumstances successively noted in this essay, which limit the sphere of action of malaria, that we are to attribute the salubrity of our "pine land settlements"—their comparative, I might indeed, with regard to some of them, venture to say, absolute exemption from its pestilential sway, and the happy protection which they afford. The necessary combination of this poisonous agent with aqueous vapor; its weight, which prevents it from rising to any great height, and obstructs its conveyance to any great distance, unless when wafted by winds, which at the same time dilute and disperse it; and the attractions and affinities which cause it to adhere to the foliage of trees, and occasion it to be more or less acted on by their exhalations; these are the conditions that control its activity and afford us an opportunity to evade its evil influences. Situated

as these "settlements" are, in the very heart of our fertile low country, surrounded by, and closely invested with swamps, rice fields and morasses, their existence is of the utmost importance to the agricultural population. Shaded by the lofty pine, fixed on a soil light, arid and absorbent, and unincumbered by low, thick masses of underwood, we have here united in our favor a certain degree of elevation, these tracts being well entitled to their common appellation of "ridges"—comparative dryness, both of air and surface; sufficient ventilation, free admission being given to the sun's rays and the winds, from whatever direction; the presence of trees, and these of a genus whose terebinthinate effluvia are almost universally believed to exert an influence of a balmy and salutary nature.

To preserve these advantages in their full value, however, much attention seems to be necessary. The most perfect cleanliness of yards and offices should be observed; nothing should be planted near the dwellings, even the delights of the flower garden being prohibited; and all offal of every kind, burned or buried at some distance. It has been recommended that a new position should be selected for each house, every fourth or fifth year, and that it should be rebuilt of new materials. Some of these villages, however, have subsisted for a long series of years, and still retain their reputation as healthy residences.

Houses in a malaria country, should always be situated on the highest points of land attainable; they should be raised a few feet from the ground, on an open foundation, and great care must be taken that no water be allowed to stagnate under or near them; with this view, drains should be properly and efficiently arranged and covered over; they should be built on the western side of any water course or swamp, if there be one in the neighborhood, and until the draining of such swamp be completely accomplished, the underwood should be left to line its banks. A screen of trees should be planted between it and the house, which should be surrounded also, by a considerable body of trees, cleared of undergrowth, and trimmed sufficiently to allow free ventilation and the abundant admission of the sun's light and heat. Pines should be preferred; if they are not at hand, I think there is some reason for the selection of hickory. During the summer and more especially in autumn, fires should be lighted at

evening, and kept burning until an hour after sunrise. Blinds should be shut in at the same time, and the windows hung with curtains to impede the entrance of the chilly, moist night air.

It has been remarked, that the presence of our long gray moss (*Tillandsia Usneoides*) upon the pine, is an indication of a bad state of the air, and that the gradual encroachment of this parasitic vegetable upon the trees of a ridge previously healthy, is a fair warning that it is about to lose this general, though by no means universal exemption of our sandy barrens. If the fact be so, it is of easy explanation. The moss delights in moisture, and attaches itself to the growth of moist places. It forms thus a good hygrometer, and gives notice that the stagnant waters of the neighboring low grounds are becoming more abundant, and spreading over a wider extent. We might perhaps avert the threatening, by timely and perfect draining, and it is to be lamented that such attempts have not been more frequently and energetically made, rather than yield, as we have too often done, point after point, to the pestiferous dominion of this evil spirit of the marsh. The only hope, indeed, of our low country, must be fixed upon the system of general and perfect drainage. The noxious material is inexhaustible in amount; the heat of our climate will remain the same; if then, we cannot convey off the undue moisture, so as to diminish notably the decomposition and evaporation to which it conduces, this fertile portion of our territory must forever continue to be to the same extent as at present, uninhabitable by its owners, and abandoned in great measure to the management of slaves and hirelings. Nor should we be discouraged by the vastness of the undertaking, from a fair and persevering endeavor. By these means many large tracts of bog and morass, as even in the pontine marshes, have been reclaimed, and found richly to repay the labor expended on them. The enterprise of our sister city Savannah has, within a few years past, instituted an expensive experiment of the effect of drainage; and the system of dry culture applied to the rice lands in her vicinity, is said to be already productive of beneficial results. Every southern philanthropist must pray heartily for its entire success.

On the same principle as above stated, I account also for the great abundance of insects and vermin to be found in miasmatic

situations, and for the common belief, that an unusual multiplication of gnats, flies, muskitoes, etc. betoken the approach of an unhealthy season. These little creatures luxuriate in moisture, which, with heat, is so necessary to their production, and so much fosters their increase as to have been supposed by not a few philosophers fully capable of developing or generating them.

It is necessary to receive with some modification, the almost universal opinion of the connection of a disagreeable odor with the presence of miasmata. It depends upon the nature of the exhalation; for there are many offensive effluvia, especially those which result from the decay of certain animal matters, which, however they may deteriorate the atmosphere and render it unfit for respiration, yet are not of a febrific character, and therefore do not come under the head of malaria.

Nothing is better known than the influence of density of population in diminishing the tendency to malaria diseases. This is accounted for in a variety of ways. The number of culinary fires kept up, must promote a certain degree of dryness of air; the smoke produced in the combustion of coal and wood, and the other chemical changes resulting from such combustion, may affect the nature and properties of malaria; the substitution, in a city, of animal offal, for decaying vegetable materials, must have an effect in diminishing the number and intensity of diseases, which are generated by vegetable effluvia. MacCulloch and De l'Isle, however, proceed to a most extraordinary extreme of error, when, fixing their attention upon the topic of malaria exclusively, they venture to assert "that the most offensive quarters of a city are sometimes the most healthy." It never can be so; the cleanliness and free ventilation which promote the sweetness and purity of the air, at the same time and of necessity equally conduce to its respirability and salubrity; the opposite conditions of confinement and filthiness first nauseate and disgust, and then debilitate and destroy us, though by diseases differing widely from those of malaria origin.

I shall conclude this discussion by a few remarks on the important subject of acclimation. I have said, that the most continuous residence of a native in a malarious region, does not give entire immunity from the influences of this pervasive poison, but it is unhappily true, that a stranger has too much reason to

dread the fatal violence of its effects upon an unprepared constitution. It is in hot climates that these effects are most frequently and intensely developed, and in the persons of new comers or emigrants from higher latitudes. The permanent impression of cold upon the human system cannot be exactly described; we call it tonic, constringent, roborant. That of heat is, probably, directly opposite, and its relaxant qualities are greatly increased by combination with undue moisture. Very different, then, will be the states of constitution resulting from habitual exposure to these two habitual temperatures—very different the predispositions to disease built up in the constitutions so modified. One who has become familiar with the influences of heat, having gone through a regularly progressive series of effects producible by it, directly or indirectly, in warm climates, by continuous residence, is pronounced, in common language, to be acclimated there; he is now less liable to their endemic diseases. If, however, he returns to his colder home, he loses this assimilation more or less entirely, in proportion to his longer or shorter absence. In like manner, a young native may lose his original assimilation by absence. We recognize as dangerous to such a person, a summer tour at the North or in Europe; but it is not considered as it should be, that an equal, nay, a greater risk is incurred, by spending a winter away from his Southern birth-place. The difference between the warmth of our summers and those of northern countries, even so far as Russia, is vastly less than that which prevails between our winters and their's in severity of cold.

Something resembling the effect of such absence upon an individual may occur to whole communities. Suppose that, instead of our going abroad to suffer a Northern winter, such a winter should come upon us at home. Is it not evident, that the general constitution would lose, in a greater or less degree, the protection afforded us by previous assimilation, and we shall have become, to a corresponding extent, comparatively strangers? If, in the succeeding summer, the causes which produce the development of malaria, should be active, we shall be found specially liable to its influence, and its spread will be extensive. Facts, I think, will be found to confirm these views.

Observe then carefully, collect diligently, and record faithfully

all the facts which may hereafter come within your reach relative to these interesting topics. I will not abandon the humble but consolatory hope, that it is yet reserved to our profession to discover means by which we shall neutralize and destroy this most virulent and widely distributed poison. In order to do this, however, we must detect its sources, ascertain its nature and constitution, and clearly trace its *modus operandi*. Such knowledge must be gradually acquired, and each of us may and ought to add something to the accumulating mass.

CHAPTER IV.

ÆRIAL POISONS—ANIMAL PUTREFACTION.

AMONG the ærial poisons, we must enumerate the products of animal putrefaction. As in the instance of malaria, the presence of which we infer in certain atmospheres, though undetected by endiometrical experiments or chemical tests, so in the present case, we suppose that certain deleterious substances are produced or eliminated, besides the gases which we can collect during the process. Our senses, indeed, are highly offended by volatile matters of disgusting odor; and nausea, syncope, and even asphyxia, are known often to follow exposure to these revolting exhalations.

It is evident, that these effects are not accounted for by the gases which are released during the decomposition of animal matter; it is equally evident, that it is not merely the unpleasant impression made upon the olfactory nerves and the sympathetic disturbance thereby excited; for many persons are sickened who feel no disgust, and in whom prostration and fever are not preceded by nausea. It is farther true, that in some places where the most offensive collections are presented, the residents enjoy apparently good health, as in the knackeries near Paris, and in the establishments for the manufacture of adipocire at Boston, in England. From such exceptions as these last, a few recent writers have been led, strangely enough as it seems to me, to

deny that animal putrefaction possesses any tendency to create disease.

I am willing to allow for a degree of exaggeration in the statements offered from time to time upon this subject; but, on the whole, I cannot but regard it to be distinctly made out, that the results of this process are highly deleterious to human health. From ancient and from modern history, not a few examples could be cited in which the putrefaction of bodies left unburied, or insufficiently inhumed on the field of battle, gave rise in the neighboring districts to pestilential maladies. The danger of interment within the limits of cities, has been of late the theme of frequent discussion, and experience has fully proved the cemeteries of London and other great cities to have been abundant sources of disease and death. On the European continent, where the practice of burial in and beneath the church, as peculiarly consecrated ground, has long prevailed, chemists have been repeatedly called upon to disinfect these sacred edifices and purify them by the employment of supposed counter-agents. A remarkable example of the evil here spoken of, is given by Maret as occurring at Saulieu in Burgundy, in 1773. "A grave was opened in the church of St. Saturnin near another in which a large body had been interred twenty-three days previously. From the opening there issued a very fetid odor which filled the church and affected every one who entered. Of 170, there were taken ill with a malignant putrid fever 149; eighteen died, among whom were the curé and the vicar of the church."

Walker, in his "Gatherings from Graveyards," and Pascalis of New-York, have collected many instances of similar nature. It seems to me unnecessary to enter into any labored course of reasoning or consume your time with any lengthened recital of examples to establish the doctrine thus generally received. The evolution of large masses of irrespirable and noxious gases, which takes place in the decay and putrefaction of animal matters, must inevitably pollute the air and render it more or less unfit for the support of human life. Nature warns us too by the offensiveness of the effluvia thrown off, and by the languor, nausea and prostration which they directly induce, of the danger of exposing the constitution to their mischievous influence. Of the alleged instances in which such collections of putrefying animal matter

proved harmless nuisances, I would remark, that none of the causes of disease are invariably and under all circumstances active and efficient; that they all need, to give them force and make them operative, some concurrence of favourable conditions; and that they require a certain degree of concentration, and of intimate application to enable them to overcome the habit of healthy action acquired or fortunately inherent in the constitution.

The morbid results of exposure to the products of animal putrefaction do not seem to be as definite in themselves, or as uniform, nor have they been so industriously traced as the more frequent and interesting effects of malaria. There is, however, a general agreement in the opinion, that the typhoid affections, those which imply a low form of fever with vitiation of the circulating and secreted fluids, are most likely to arise from this source.

I mentioned in passing, that animalcular putrefaction had been suggested as "the cause of the diseases commonly attributed to stagnant waters and marsh miasmata." All water in which vegetables or parts of vegetables have been infused for some time, is found, on becoming corrupt or putrid, to contain infinite numbers of animalculæ. Mr. Dwight, on examining the pellicle or scum which floats on the surface of such infusions, with the microscope, perceived it "exhibit, after a few days, an immense number of living beings. On examining the same scum some time afterwards, not the least appearance of life was visible. In another short period it was again replenished with living beings; and this alternate process went on, until the water became so fœtid as to forbid farther examination." The conclusion which he drew from these facts was, that the first race of animalculæ having laid their eggs, died, and were succeeded by a second, a third, and so on. The fœtor which arises from the putrefaction of these ephemeral creatures, he describes in forcible terms, as somewhat peculiar. "Although it was perceptible at a small distance only, and perhaps less loathsome than the smell of a corrupted carcass, it was far more suffocating. When the effluvia were received into the lungs, it seemed as if nature gave way, and was preparing to sink under it. A pungency entirely peculiar accompanied the smell, and appeared to lessen the visvitæ in an unprecedented degree and manner."

The purest natural waters, indeed, whether of springs or rivers, or from the clouds, as we ascertain upon examination with microscopes of sufficient power, teem with minute life. Stagnation develops in each small drop, millions of animated creatures, of infinite variety of form and habits; these are more numerous and larger, when the vivifying principle of heat and the nutriment of vegetable infusion have been afforded them. Soil, of whatever kind, whether loose or tenacious—whether clay or sand—upon which water has fallen, and from which it has evaporated, must have deposited upon its surface an invisible pellicle of these miniature beings, destined to pass through the several stages of corruption and decay. I have often observed that the purest rain water which had been collected among the clear white sand of Sullivan's Island, if not drained off soon, became exceedingly offensive. The noisome smell was more intense and sooner perceptible, if a high tide had mingled with these fresh pools a proportion of salt water—in accordance with the statement made by Sir John Pringle, as to the greater rapidity of putrefaction in such mingled or brackish waters. The offensiveness or putrescency of fresh pure water, in a basin of clean pure sand, is only to be explained by a reference to the animalcular decomposition which there takes place. That it should occur sooner and more notably, when some mixture of salt water is present, may be owing to the larger size or the greater number of the creatures contained in the latter, and to the greater readiness with which both die in the elements unfriendly to them. We must not smile at the pathological importance attributed to these almost invisible tribes, either while living or after death; their immense multitude compensates abundantly for the extreme minuteness of each individual belonging to them.

Before proceeding to my last remaining division of "animal poisons," I will make a few observations upon parasitic animals as causes of disease. The nature of these creatures, the qualities of their several secretions and excretions—for by the very fact of their organization and vitality, we know that they must secrete and excrete—their habits or modes of life, are so little understood, that we are scarcely warranted in expressing a positive opinion as to the kind of influence each may exert upon the hu-

man body, in the position it is made to occupy. Some of them, however, would seem like the *lumbricus*, to be merely irritative by their presence and habits; and others, like the *acarus psoræ*, to possess the power of arousing specific inflammation, whether by structure, secretions or habits.

All living creatures, as far downwards as we are able to trace the history of the animal creation, are subject to the presence of parasites or dependants, who subsist upon them, and in turn supply a smaller race of adherents with a portion of the superfluous fluids which distend their vessels. This mutual relation is one among the regular ordinances of nature; and with regard to a very extensive class of parasites does not seem to do any injury to the organism. An undue or disproportionate increase of number is, however, always a source of annoyance, and may give rise to serious or even fatal irritation. These observations apply especially to the intestinal worms which infest our species. Of these there are several varieties, whose generation within the body is altogether unaccountable, and forms one of the most plausible instances, among those alleged by philosophers, of the spontaneous development of life and organization. The *lumbricus* or round worm, so familiarly known to parents and nurses, is indeed very rarely wanting in the bowels of children, and is frequently met with in the alimentary canal of the most vigorous adults. Parr, Rush and several other physicians, have regarded them, on account of their uniform presence, as intended for some useful or salutary purpose in the animal economy; perhaps aiding in the removal of effete portions of the food taken. I am by no means disposed to coincide in these views, although I believe that they very often bear the blame of occasioning diseases in which they have had no share. I do not believe them to be capable of producing any specific form of disease; but they give impulse and efficiency to a great number and variety of morbid influences. By inordinate increase of number, they impair the constitution, preventing the free and due performance of the functions of the intestines, whose surface thus takes on a diversity of modes of irritation. Even when present in moderate number, they may become, by a change in the condition of the mucous tissue of the digestive canal, sources of severe additional excitement and disturbance.

The ascaris, thread-worm, or maw-worm, found often in considerable masses in the stomach, and at the extremity of the rectum, gives rise to a very annoying irritation. In the former seat, they produce irregular appetite and imperfect digestion, and in the latter they occasion a most intolerable pruritus.

The most to be dreaded, however, of all the inhabitants of the alimentary tube, is the *tœnia* or tape-worm, of which there are affirmed to be two or more varieties. By their mere presence they bring on an intense degree of uneasiness and suffering, which continues for months and years—nay, even for a long life. They are very tenacious, and as each joint seems to possess the faculty of reproduction, are exceedingly difficult to get rid of. They rarely excite acute or fatal maladies, but they wear out the patience and strength of the victim by perpetual distress, colic, diarrhœa, emaciation and atrophy.

I shall not dwell upon the long catalogue of internal worms and other entozoa, the trichuris, strongulus, distoma, etc., furnished us by Brera, Rudolphi, and others. They are mere pathological curiosities, which it is possible, but not very probable that you will meet with, except in museums. I need not do more than mention the ancient morbus pediculosus, of which died Herod the tetrarch. Always rare, it is now exterminated by modern civilization and cleanliness. An approach to it, however, occasionally occurs in the matted heads of our plantation—slaves. The hair of other parts of the body is sometimes affected by individuals of the same genus.

You will seldom, if ever, meet with an example of the Guinea worm, dracunculus, or *filaria medinensis* which seems confined to the tribes of native Africans. Since the abolition of the slave trade, it presents itself no longer, but in early life I saw several negroes affected with it. I do not entertain a doubt that it is a true animal of a peculiar species.

Nature teems with insect and microscopical life; creatures of infinite minuteness, and of multitude beyond conception, inhabit the food we eat, the air we breathe, the waters with which we quench thirst, and the fruits which we regard as objects of luxury. It is no wonder that Leewenhœck finding all our fluids charged with animalculæ, should attribute to them their peculiar properties; nor that Linnæus and his followers should ascribe to

their specific influences, the excitement of all the varied forms of disease. One of his suggestions seems fairly substantiated by the re-discovery in recent times, of his *acarus psoræ* or itch insect. At one of the Paris hospitals, M. Recamier, the attending physician, half jocosely proposed a reward for the detection of such a creature if it existed. Thus stimulated, several of his class bent a special attention to the subject, caught the intruder, and soon made out satisfactorily and distinctly his form and habits. The difficulty of finding him, it is affirmed, arose from the circumstance, that he did not reside in the itch-vesicle where he had always been looked for, but made his den at a small distance, establishing a canal of communication. The *acarus dysenteriæ*, and other varieties of *acari*, are yet to be found. We know nothing definitely, of the insects to which Neale and others ascribe the rise and spread of cholera, plague and malaria fevers; their very existence seems to me mere matter of fanciful conjecture and unsupported hypothesis.

We next go on to the consideration of animal poisons, properly so called. These I shall divide under three heads, and speak first of such as are produced by the natural and healthy functions. Nature has in this way provided with a very effectual defence from injury and a very terrible mode of attack, some of her progeny otherwise weak and liable to harm from the larger and more powerful tribes. The bee, the wasp, the hornet, thus protect themselves, and with some other similar insects, are capable of inflicting severe pain; nay, their sting has, in more than one instance on record, produced fatal irritation. Still more fearful is the venom of some of the serpents, as the viper, the rattle-snake and the cobra de capello. Some of the spiders and scorpions are also to be added to this list. We are not sufficiently well informed as to the nature or essential qualities of the poisonous secretions of these several creatures. It seems probable that it is of an acid nature, from the efficacy of the volatile alkali in relieving the pain it produces, and if the statements made are to be relied upon, even arresting the rapid progress of the severer evils arising from the bites of the poisonous snakes and other reptiles. The rapidity with which death follows the insertion of the venom in some cases, is terrible, and

led naturally enough, to the belief that the system was affected directly and promptly by an influence exerted upon the nerves of the wounded part. It is now, however, admitted, I believe universally, that the virus enters the circulation and exerts its morbid influence upon the vital fluid itself, and the surfaces to which it is carried.

Secondly. We must not omit to remark, that the processes of disordered functions, in disease, immediately preceding death, or some peculiarity in the mode of decomposition, immediately following death, from disease, seems to be efficient in the production of a poisonous or deleterious property in the dead bodies of animals. Hence the common sense and experience of mankind have enjoined an abstinence from the flesh of such animals as have died of disease. I said above that there was some peculiarity in the mode of decomposition in these cases ; this is evident from the familiar circumstance, that epicures eat safely of meat, and especially of game kept until a certain degree of putrescence has become obvious, and is perhaps, better proved by the fact that even the dogs and vultures which prey on carrion, are sometimes poisoned to death by the flesh of a particular carcass. It is here, too, that we must notice the frequent occurrence of irritative fever, accompanied with cutaneous eruptions, boils, and a variety of other irregular and annoying symptoms, among anatomists, from punctures and abrasions made during the process of dissection. The periodicals have teemed with histories of such cases of greater or less violence, from slight disorders of the system, to attacks of malignant and mortal power. The "subjects," from the employment of which, these accidents have taken place, have died of very different forms of disease, and nothing has hitherto been clearly ascertained concerning the precise nature of the morbid influence exerted. A troublesome inflammation commences at some point which has been slightly wounded by the scalpel, or where the acrid and noisome fluids of the foul and putrefying corpse have found their way into some slight ulcer or abrasion of the hands. This becomes painful ; swelling and imperfect suppuration follow ; a red line marks the upward course of the inflamed absorbents ; or small and "grievous" abscesses are formed on different parts of the surface, and not unfrequently an anomalous eruption of copper

colored blotches covers the skin. In the more severe cases, these symptoms are attended with a low typhous type of fever, with wakefulness, tremors, delirium, and great prostration of strength.

In all maritime countries, but more especially on the southern shores of our continent and in the West India islands, it is well known that fish, which generally take a high place among the luxuries of the table, are at particular seasons or under particular circumstances unfit to be eaten, and indeed, absolutely poisonous. Some of the customs of our fish-markets having all the force of law, are founded upon this known fact; and even in our western rivers the large cat-fish and the buffalo-fish, are thought in the summer months rather dangerous food. A similar opinion prevails all along our coast as to the shell fish, which are so abundant, and at other times so eagerly sought for. None dispute the correctness of the assumption, but there are different suggestions offered, to account for the morbid condition alluded to. It is supposed by some that at these periods the fish in question, undergo some spontaneous change, some periodical deterioration of health, which renders them unfit for food; others again, imagine that they procure at such times some species of nourishment which taints their juices; and others still, refer it to temperature merely, alleging that the substance of which fish are composed is extremely ready to run into incipient putrefaction, and that all the consequences are ascribable to the state of obscure and yet undefined putridity in which they are eaten. Although I do not deny the morbid and irritating quality of putrid food—for I shall hereafter have occasion to mention several cases of gastritis, which I saw originate from such food—yet it may be replied to this last explanation, that such “surfeits” as they are often called, gastric disturbances, cutaneous eruptions, and other distressing affections, from a fish diet, frequently take place, when the muscle of a fish is fresh and firm, and exhibits no sign of the slightest decay, and that the effect of temperature is by no means invariable.

3. A large proportion, and to the pathologist, the most interesting one, of the animal poisons, is the result of morbid secretion. We may again sub-divide this class into two—the first, consisting in some change in the qualities of one of the established or

regular secretions resulting from the diseased alteration of the action of the gland which produced it; the second, in the production or creation of a new matter by the excitement of an entirely new action in the vessels concerned.

Of the first, we have examples in the hydrophobic saliva—a fluid formerly innocent and of important use in the digestive function, being suddenly endowed with the most terribly destructive property; and in the milk of a cow attacked with that mysterious disease, known among our western mountains by the expressive title of milk-sickness. The second sub-division will comprise vaccine, small pox, and all the other varieties of contagion, a new matter being in all of them produced or created by new actions.

Hydrophobia, unhappily too familiar everywhere—the most uncontrollable form, perhaps, which the legion spirit of disease is known to assume, is of possible spontaneous development in the canine species—perhaps the feline also, though this is uncertain. Much has been said of a hydrophobic state of fever, as occasionally seen in the human subject; but the resemblance or analogy is too distant to deserve a moment's notice. The contagion of hydrophobia resides in the saliva of the animal affected, and although it is communicable in this way by a bite or inoculation, from one animal of either of the tribes above mentioned to another, as in the dog, wolf, fox, cat, etc., and from these to animals of other species, yet, in these last, it ceases to be contagious, the saliva in them being imbued no longer with that peculiar property. Good, and others, it is true, have collected instances in which the saliva of a man intensely angry seems to have been poisonous—but not hydrophobic; that is, the bite moistened with morbid saliva, produced a malignant and severe ulceration, with many unpleasant consequences.

Milk-sickness is a very peculiar affection of animals—an endemic—a disease of very limited extent locally, and of singular character; the cause of which is yet unknown, and its very nature not clearly made out. A cow affected with it, if she give milk, will usually seem in ordinary health; but her milk and the butter made from it, excite in those who make use of them as food, a violent and often unmanageable gastritis, combined with typhoid symptoms. A cow not giving milk—other cattle, horses,

nay, even hogs, die of this strange disease; and the dogs and vultures which prey upon their carcasses are often attacked and sometimes die. If the flesh of an ox laboring under this disease be eaten, it brings on the human subject the same symptoms which follow the use of the poisoned milk and butter.

It is scarcely matter even of rational conjecture, whether the pustules which are found on the udders of cows, so familiarly known as vaccine vesicles, are the product of any form of general or constitutional disorder in that animal. Jenner, and others, attribute them to inoculation by the hands of the milkers from the matter of what is called "the grease," an ulcerous eruption in the heels of horses. This, however, is by no means established. Nor is there any proof of the notion so much urged upon us at one time, that vaccine in the cow is the result of the small pox contagion, received by that animal from man, and modified in a characteristic way by the inferior constitution.

All that we clearly know on the subject is, that whether spontaneously developed or excited by any extraneous agency; whether a symptom of general disease or a mere local inflammation, pustules are formed on the udder of the cow, which contain a contagious matter—a poison exciting in man, when inserted into a wound or rubbed on an abraded surface, both a well defined local inflammation and a notable degree of fever and other constitutional disorder; and that in all the species susceptible of it, it retains its contagious property, the lymph of every mature vesicle being imbued with this power. Incidentally, we have discovered, and all civilized nations of mankind are exulting in the discovery and making daily application of it, that an individual who has once gone through the local and constitutional affection alluded to, is always afterwards protected, either absolutely or in a very great degree, from the infection of another form of contagious disease, small pox, a pestilence in ancient times most justly dreaded.

The general topic of contagion, however, deserves and must receive from us a distinct and careful consideration. It involves a series of discussions not only of wide extent and great speculative difficulty, but of the most direct practical importance. They fill a large space in the details of political and municipal hygiene. The opinions held and expressed by the vulgar in reference to

this matter, as well as those of medical men and philosophers, exert an immediate influence upon the legislators and governments of all civilized nations, and so modify and control the regulations which define the commercial and friendly intercourse between them.

Let us, then, fearlessly and impartially, proceed to fulfil our professional duty—first, thoroughly to inform ourselves, and, next, to instruct our fellow-citizens, and create an enlightened public opinion.

CHAPTER V.

CONTAGION.

CONTAGION, the subject of to-day's discussion, is a topic of as direct and practical importance as any, probably, among those that have attracted and are to claim our notice. The obscurity and doubt in which are involved many of the doctrines that relate to it, are the more to be deplored, as there is a pressing and unavoidable necessity ever urging us to action upon some definite opinion, which we are not permitted to hold in philosophic uncertainty or farther speculative debate. The shadows of undefined and ill comprehended truth lead often into fatal error, and as yet, we have in this vast field of inquiry surveyed and measured, and taken possession of very little acknowledged or undisputed territory. Of all our professional investigations, this is the most beset by prejudice, and warped by fashion and interest, and happy, indeed, shall we be, if we overcome all the impediments in our way, and set forward, with unbiassed feelings, in the research. Our conclusions here must be, from time to time, announced for the direct guidance of those who form and modify the regulations of what may be called foreign or external hygiene. No wonder, then, that the questions we are now about to agitate should excite so earnest an interest in the public mind; they involve in their decision the welfare of all classes of every

community. Commercial and political intercourse between distant nations, and even between component parts of the same empire, may require restraints of the most despotic and intolerable character, which, to impose without sufficient reason, would be the height of impolicy and levity. Similar restraints, alike inconvenient and distressing, may become requisite even among familiar friends and the nearest kindred ; and in the endeavor to indicate the precise times, circumstances and conditions of such restraint, we shall be inexcusably vacillating and uncertain, if we have not previously given to the subject our diligent and conscientious attention. I propose, in this essay, to pursue the inquiries which we are called upon to make, in two modes—*first*, collecting such facts as have been observed upon the matter of contagion itself, considered as a cause of disease—its nature, qualities, effects and modes of action ; and, *secondly*, condensing into as brief space as may be, the views which I entertain of contagious diseases as a separate class—their history, their origin, the laws which govern their progress, their propagation and their transmission from place to place. They demand to be discussed here and in this connection, as they are the obvious and exclusive sources of the matter of contagion, now to be treated of as an animal poison, and one of the causes of disease.

Contagion may be defined a peculiar modification of matter given out by a *diseased* body, which possesses the characteristic power of generating in a healthy body, when brought to act upon it, a condition of disease similar to that which produced it.

Some confusion has arisen from the indifferent and promiscuous use of the terms contagion and infection. This is, indeed, almost unavoidable, on account of the poverty of our language, in which contagion exists as an insulated noun-substantive, without any collateral verb, having been introduced from the Latin and applied figuratively. We can get rid of this philological embarrassment only in one way—by a conventional definition, namely, which shall confine, limit, and designate accurately, the meaning of words which we are about to employ. I shall adopt the distinction proposed by Wilson Philip, in his treatise on febrile diseases, in which *contagion* is pointed out as “the morbid poison,” and *infection* as the act of communicating the disease.

Some have committed the error of including, under the gene-

ral head of contagion, all the animal poisons. Many of these have plainly no claim whatever to be so regarded, and others, which may seem on a careless examination to be properly placed here, are excluded by the terms of the definition. Hydrophobia, for example, denoting by that name the whole train of effects consequent upon the bite of a rabid animal, is thus refused admission, on the ground of its incommunicability from one subject to another, in the human species, although transmissible in the canine and feline race. Our subject is human, not universal or even animal pathology. It stands to us precisely on the same ground with the morbid results of the bites and stings of numerous reptiles and insects, endowed with venomous powers. Glanders, according to Dr. Elliotson and some other British writers, is also communicable by inoculation from the horse to his groom, or attendant; but we have no proof that it is contagious among the higher order, in the sense of our definition. We may affirm the same incapacity of communication in the case of dissection wounds, and the terrible diseases that have followed the transplantation of teeth. Cullen, as Haygarth tells us, expressed himself thus: "Contagion is a matter always deriving its origin from the human body." If vaccine be not originally small pox, modified merely by passing through the systems of one or two of the inferior races, it is an obvious exception. I know in fact of no other example of a morbid secretion originating in a lower class of animals, which when applied to the human body, occasions a contagious disease—that is, a malady transmissible in any manner from one person to another.

Some have maintained, indeed, as I hinted above, the opinion that the vaccine is primarily and in its distant origin, variolous—identical with small pox—but modified and changed in its aspect, by successive transmissions through the constitutions of other species, as the horse and the cow. The peculiarities of the vaccine are, however, too well marked and characteristic to allow of the adoption of this idea. It differs as much from small pox in all its habits and properties, as any two of the exanthemata from each other.

Still more objectionable is the loose phraseology which refers to the exhalations from dead animal matter, in a state of putrefaction, as sources of contagion. They produce disease undoubt-

edly ; but such disease is not, of course, or generally contagious or communicable ; though, perhaps, in some instances it may become so.

The matter of contagion may exist either in a palpable or impalpable form. Of palpable contagion, we have examples in the virus of vaccine and variola, psora and syphilis. We can inoculate with the fluid secretion from the pustules in these diseases. Of impalpable contagious matter, we infer the existence in all cases, in which we have detected no palpable secretion—as in pertussis, scarlatina, typhus. We observe that some contagions are efficient at a certain distance from their source, besides being communicable by inoculation or application to the skin—as measles, small pox, plague. We conclude here, that the contagious matter is soluble or diffusible in the air, or that an impalpable as well as a palpable secretion is given forth.

Of the nature of the matter of contagion, or of its qualities, we know nothing. Chemists have made no satisfactory experiments upon it ; and although theorists have not been wanting, who imagined in it an alkaline, or acid acrimony, yet no facts are adduced in favor of any of the hypotheses offered. Such ignorance is to be lamented, because if its specific properties can be supposed to be essentially connected with its mechanical or chemical qualities, we may hope, in detecting them, to be guided to some corrective or counter-agent. We know but of two correctives of contagion—lime and heat ; is it unreasonable to inquire whether these do not act chemically upon the poisonous substance under consideration ?

With the ultimate effects of contagion as a cause of disease, we are but too familiar, in the production of the worst forms of pestilence ; but of its immediate efficiency, we have a very obscure notion. The majority of pathologists regard it as sedative or depressing, and the account given of their sensations by those who have been infected by highly concentrated and intense contagions, favors the opinion. Yet it is seldom that they seem to produce any present influence upon the constitution, lying dormant, as it were, for a time, like seed sown in the ground, and then breaking forth with irresistible energy in a train of malignant consequences, some earlier and some later ; some at a definite period, and others at an uncertain interval, and these latter urged

forward and retarded, some of them by definite and well known modes of constitutional predisposition, and others in the most obscure and irregular way. It is curious to observe, that this silent process—these latent changes, are in no degree influenced or modified by the quantity of contagious matter efficiently applied. By extreme dilution, we may *prevent* the effect of such contagion; but it is out of our power to *graduate* this effect. Such is certainly the fact with the palpable contagions. If we inoculate any one with the minutest atom of vaccine matter or variolous, he will be affected, if affected at all, with just as vehement and severe disease as if we insert the greatest amount possible. And this has been made the basis of a diagnostic definition of the terms virus and poison; the latter depending, for its effects, upon dose or quantity. The independence, on the other hand, of a contagious virus upon the amount applied, has been supposed to afford ground for the belief of a contamination of the fluids of the infected body—a progressive and universal series of change and assimilation.

The modes of action in which contagions exhibit their power, are also various. 1. Some require a wound into which matter, in palpable form is to be inserted by inoculation or application where the cutaneous protective tegument has been abraded, as vaccine, herpes, tinea capitis.

Under this head, we ought to include those diseases which are transmissible by sanguineous inoculation, if we may so call it, or transfusion of blood. Dr. Home, of Edinburgh, re-produced measles by inoculation, with blood drawn from a superficial vein in a thick patch of the eruption, and Professor Speranza, of Mantua, has often repeated the experiment successfully. Small pox reaches the fœtus in utero. Coleman inoculated by transfusion both farcy and glanders. In the same manner have been communicated malignant pustule, mange and hydrophobia.

2. Some affect the sound skin, but demand circumstances favorable to a protracted application, as psora, syphilis, gonorrhœa.

These assume the palpable condition; the impalpable contagions exert a more extended and dreadful potency.

3. The next class require, generally speaking, confinement within a limited amount of air for a notable space of time, which air we suppose to be impregnated with the matter of specified

contagion. Of this sort are typhus, hospital gangrene, erysipelas. This condition of confinement in vitiated air is favorable, doubtless, to all the forms of impalpable contagion, but is not necessary in more than a very few.

4. Near approach is an indispensable requisite, it would seem, in certain cases, liable to an exception of a very important character, to be hereafter dwelt on. Russell says, that he prescribed with safety for patients ill of the plague beneath his window, fifteen feet from the ground, and, being near-sighted, sometimes approached within four feet of the sick. Currie, and Haygarth, after great attention to the subject, are disposed to contract these bounds still more; the latter does not, I think, allow of any danger of infection beyond three feet from the body of the patient. Under this head, we include scarlatina, pestis, cholera, small pox, measles, hooping cough, mumps, sore throat.

5. Fomites. The matter of contagion, in all its diversified forms, seems capable of being absorbed by, or adhering to, some foreign substances, which retain it, in full potency, for indefinite lengths of time. These substances are called fomites. Dr. Mead placed under a bell-glass a dossil of cotton and a bit of putrefying meat. The glass retained, on exposure to the air, no smell; the cotton was strongly and tenaciously imbued with it. Woolen cloths, blankets, and other articles of bedding, wearing apparel, furs, and packages of a great variety of goods, are said to preserve, concentrate and convey the matter of contagion. It is said to adhere too to the walls and ceiling of an apartment.

Mills, in his *Statistics of South-Carolina*, has related a case so strongly illustrative of the agency of fomites and the tenacity of adhesion, with which contagious matter is endowed, that it deserves to be referred to here. The parents of a family on Edisto island, had three children inoculated for the small pox. One of them was an infant and occupied the cradle. This was the only one that died, the rest all doing well. The bed clothes were washed and deposited in a drawer. More than a year afterwards, a child being born, was placed in the cradle and supplied with the same bed clothing, which during this long interval, retained so much of the contagious matter as to communicate the disease to the little subject, who had never been carried off the island; nor was there, within its limits, either at this time

or for a long while after, a case of small pox known to occur. The mode of action of fomites is precisely that of the matter of contagion, with which they are imbued. Cotton soaked in vaccine lymph, requires insertion into a wound. Garments or furs, full of plague matter, act only on near approach ; the impalpable emanations spreading themselves a certain distance around.

At the celebrated black assizes of Oxford, and again at Taunton and Exeter, the prisoners brought into court from the jail, infected, with a pestilential fever, (under which they were not laboring, but merely conveyed in their clothing,) the judges, and other persons about them.

Physicians have been often known to communicate, in this way, diseases from patients whom they visit, to healthy persons ; themselves not suffering by the conveyance.

Perhaps the most striking examples of this sort are found in the conveyance of puerperal fever by obstetric practitioners, one of whom tells us of his communicating this fatal disease by neglect in carrying about *his gloves* only, having changed every other article of his dress.

6. Atmospheric diffusion. The most important, however, and injurious of all the modes of action of contagion, is its epidemic diffusion in the atmosphere. This diffusion may be to a greater or less extent, or exhibit a greater or less intensity, according to circumstances. How long will professional men tolerate the confusion at present made between what are called contagious, endemic and epidemic diseases ?—how long will they consent to employ these familiar terms unmeaningly, or worse ! with a significance full of error and calculated to mislead, in this serious and important investigation ?

Of what the learned call general epidemics, it is usual to confess the source and origin, cause and nature, to be entirely unknown. Their history exhibits no distinct connection with any known agent or condition, say these writers, unless, perhaps, with the flight of clouds of insects, the occurrence of volcanoes and earthquakes, and the arrival of comets, “which, from their horrid hair, shake pestilence and war.” Endemic diseases which connect themselves with certain seasons and localities, and obvious atmospheric conditions are better understood. Of contagious diseases we shall soon say something more in detail than at

present. We shall refer, in this place, to but one point in their history. It is well known and acknowledged, on all hands, that these diseases—let us take small pox as our example—when introduced into a community, may proceed slowly and progressively, step by step, assailing individuals who are exposed by near approach to the sick, and few or no others, and soon disappearing, because of the careful attention paid to it. Is it necessary for me to give instances of this sort?—they abound in medical writings. During the year 1836, numerous towns and villages in our country were thus partially affected; cities and remote farm-houses have suffered in this way. In Ashville, N. C. there were ten cases of small pox, two of which died, and so in the neighboring counties. Cases occurred thus in Richmond, Va., and in Groton, Conn. In the great cities of Europe, London and Dublin, and on this side of the Atlantic, in New-York and Philadelphia, is it not in perennial existence? The bills of mortality annually shew a greater or less number of deaths from it. But, what shall we say, when suddenly emerging from this dormant state of mere preservation, small pox, in quick succession seizes large numbers, and rapidly spreads from place to place? Then we call it epidemic, and are satisfied with the phrase. But what is it to be epidemic? It is merely that the prevalence of disease is wide and potent. Not so surely. Endemics of known origin—of defined local causation, are often both widely prevalent and potent in influence. Other epidemics are of unknown origin; but small pox is of derivable root. Plague also prevailed widely—irresistibly, in London, and yellow fever in Philadelphia. The sudor anglicanus, dengue, influenza, pneumonia, typhoides, black death, and cholera, have all prevailed widely and with almost irresistible sway. Does the word epidemic equally and in the same mode apply to all?

How does a malady, undeniably contagious, thus rapidly spread itself? Numbers are seized with it who have avoided anxiously all chances of approaching the sick, and employed every precaution against all other known means of infection. It is thus, in a singular manner, that the plague extends, as we must infer from the gloomy histories of its prevalence in the European cities, which have suffered from it. The plague, like small pox, can be conveyed by fomites also—can be received upon near ap-

proach—can be inoculated with palpable secreted fluid from a bubo. In its visitation of Norwich and other cities of the old world, and in our own country in 1816-28, variola displayed this diffusive tendency. Great numbers of persons were attacked beyond all observable reach, while they remained in the crowded cities where the pestilence held sway. But it extended less into the country by notable stages and successive steps of communication than has frequently happened, both before and since, when this quiet progress has been so slow and limited as to excite no alarm. Can we hesitate to deduce, from the mass of records accumulated on this point, that contagious matter is capable of acting diffusively by an atmospheric impregnation or contamination? When these contagious diseases have become epidemic, they attack persons who have not approached any patient lying ill, nor any fomites, it is true, but they are far more likely to fix themselves upon such as are exposed to their known sources, by contact or near approach. May we not find some aid in accounting for the facts, by supposing that the diffusible matter disseminated through the atmosphere, has affected the constitution sufficiently to generate a predisposition, though not to excite the disease, which is then lit up readily? Where there is no epidemic diffusion of contagious matter through the air, there is no predisposition in the great majority of subjects exposed casually to contact or near approach.

If the facts prove as I maintain they do, this change in the condition of the atmosphere of any city or region, and it should be observed that these epidemics almost always confine themselves to the dense population of cities and towns, it is of no importance that we are ignorant of the mode of its occurrence. I am disposed to regard it as a simple diffusion of contagious particles; others look upon it as implying a sort of assimilation of air to the poisonous character of the agent, but it serves little purpose to discuss these hypotheses. None of them, however, are more obscure than the prevailing idea of an unknown and mysterious cause, whether atmospheric, planetary, telluric—whether of animal, vegetable or mineral origin, is not even ingeniously conjectured. The argument from analogy is surely as fair and forcible here, as elsewhere, in scientific inquiries of doubtful and obscure nature. Some epidemics are not denied to

be the mere extension and diffused prevalence of contagious disease. Why is not contagion the source of all epidemic prevalence? I know that this doctrine is unfashionable and heretical, but I believe it to be truth. If I am right, all I ought to ask is fair and unprejudiced discussion.

The matter of contagion has but one source. It is the product of specific diseased action—such as it is capable of reproducing under favorable circumstances. In all its modes of existence, its exclusive origin is found in contagious diseases, upon which, therefore, I proceed to make a few remarks. The list is a long one, consisting of specimens of almost all the classes and orders of the nosologists, each of which has had its right to the position it occupies contested, and several, even now continue to be subjects of hot and vehement dispute.

Contagion, I have said, has but one origin; being the product of specific morbid action in contagious diseases, whence their appellation. But these diseases arise from various sources, and under a very considerable diversity of conditions and circumstances. All of them must have had a spontaneous beginning; some of them we see developed from time to time, under the action of known causes. Small pox appeared in Europe, at the commencement of the Mahometan era. There is no notice of it in the early writings of Greece and Rome. Mention of it occurs in the traditions and ancient books of China and Hindostan. It appeared first in Western Asia, in the Abyssinian army engaged in the siege of Mecca, in 569.

It has been conjectured to have invaded Britain about the beginning of the ninth century. We have no detail of the circumstances which gave it birth; nor do we know of its spontaneous reproduction any where subsequently; but it has repeatedly occurred when its transmission was not traceable. It was not thought to be contagious until about the time of Sydenham.

Scarlatina first appeared in Italy, as late Willan tells us, as the fifth century—Syphilis in the fifteenth. We know the causes which produce typhus, independently of contagion. I have myself traced satisfactorily its origin, from concurrent influences which engendered it, and its progress by contagion, under circumstances in which these influences could not even be suspected to

exist. Psora is produced by filth ; so are gonorrhœa and syphilis. Rubeola frequently occurs, as well as scarlatina, in an insulated way, whence Caldwell has illogically deduced an argument against its contagiousness. The same is true of mumps, dysentery, erysipelas and pertussis. Nothing can be more obscure in some of these instances, than the question of causation ; as in small pox, cholera, measles, scarlatina. The coincident circumstances to which they are to be ascribed, are happily as rare as they are terrible and afflictive ; and it is only by observation of coincidence, that we can deduce the relation of cause and effect. We have accounts not only of the birth of new contagious maladies, from time to time, as of dengue, for example, in 1827 or 1828 ; but of the actual extirpation of some of the old, as of the dreadful leprosy of ancient writers, and of the singularly mortal sudor anglicanus.

The laws which govern the progress of contagious diseases, must of course be modified by their character, and the nature of the sources from whence they arise. If, as has been frequently, but most carelessly argued, they had no other origin than self-reproduction, and depended for their existence upon the presence of contagious matter, they would be governed entirely, in their propagation, by the observed properties of such matter. Their arrest and extirpation would then be probably an easy task. How readily, for example, could we, if we wished, exterminate the vaccine ! Nay, give us but the condition of universal physical and moral purity, and many other contagious affections would soon cease to exist, as psora, gonorrhœa, syphilis. Now if the most profound degree of impurity be all that is requisite to generate these contagions, surely a tendency to them may be fairly predicated of a condition somewhat less than sufficiently deep to produce them ; and thus we attain an approximation to, or predisposition for them—and can point out circumstances in which they readily prove efficient and spread. Thus, in the poor, we have a predisposition to typhus, which gives wings to the contagious matter evolved during the progress of a case of that disease ; thus also in the mode of living of our aborigines, there is some condition which not only doubles the proportional mortality of small pox, but increases indefinitely the rapidity of its extension when introduced among them. A

similar statement is also true in reference to the negro race, when exposed to cholera.

It may perhaps aid us somewhat in our inquiries, to attempt the arrangement of contagious diseases under definite heads, as they possess certain qualities or properties, and exhibit certain powers of transmission and propagation. I have said that all contagious diseases must have had a beginning, independently of the existence or action of contagious poison. It is logically true, also, that this having happened once, may occur again, but in regard to some of them, it is an event entirely out of the ordinary course of things, and beyond the reach of our investigation. There are, however, some which arise from known contingencies, evolving in their progress a matter capable of re-producing similar disease. These may be denominated spontaneous—such as typhus fever, pestis, psora, dysentery. On the contrary, some are altogether dependent on the presence of contagious matter, of which vaccine is the most striking example, never being known to originate in the human subject; perhaps we might add variola, if it were possible to separate it absolutely from what are called varioloid diseases; but these are often met with beyond any known influence, as varicella or chicken pox. I look upon small pox as derived from these. They originate, as we see every day—spontaneously. They may, and do, however, exhibit worse appearances among the poor and filthy, and thus becoming intensified, at last generate true variola. It is evident that any malady exclusively propagable by contagion, must be liable to extermination, if we succeed in offering efficient impediments to its spreading, though afterwards it may be re-produced, to be sure, in the same way in which it was first brought into existence. Yet this, it is evident, requires, as to some of them, a combination of chances so rare, that the danger of such re-production need not enter at all into our calculations.

Many, but not all the contagious diseases, are of febrile character. The exanthemata are, of course, included under this head, and erysipelas is added by some to the list. We may arrange here also, typhus, cholera, dysentery. The chronic or non-febrile contagions are, all of them I believe, in their origin cutaneous, though some of them in their progress inqurate the entire organism, as lues venerea, yaws, siveens.

A great majority of the febrile contagions are self-limiting—as vaccine, variola, and the other exanthemata, properly so called. A few exceptions occur—as typhus, cholera and pertussis. The chronic are all, I think, illimitable.

I have already spoken of the different forms of the matter of contagion, as palpable and impalpable. Some contagious diseases produce them both—as variola, measles, scarlatina, pestis, and therefore propagate themselves by near approach and atmospheric diffusion, as well as by the chances of contact and inoculation. Others again, as typhus, pertussis, mumps and cholera, shew no palpable contagious matter, and a third class present contagious matter in a form exclusively palpable and incapable of atmospheric diffusion. These I designate as the concentrated.

But one of the febrile contagions is found here, upon whose admirable peculiarities it is impossible to reflect without a grateful enthusiasm. Unlike all others connected with pyrexia, it gives out no contagious emanations at any stage of its progress. These emanations, in other instances, affect the body either by cutaneous or pulmonary absorption, while the palpable contagions act even upon a sound and natural surface. Vaccine on the contrary, produces no effect unless inserted into a wound, or introduced under abraded cuticle, nor does it ever occur spontaneously or without our own act; so that of all the poisons, this salutary one, if I may use a phrase apparently paradoxical, is the only one which we have completely under our control. We may preserve it as long as we will, but it does not adhere to or spread accidentally by fomites. We may communicate it when we please, but it never extends itself by mere contact or the closest approach.

It behoves us not to omit the fact, that some contagious diseases are endowed with the singular and beneficent property of causing by their action on the human system, an alteration so great and so permanent, that the individual once affected by them, is forever afterwards secured from a second attack. Such are variola, rubeola, parotitis and pertussis. The change of constitution thus spoken of, is, as I have stated, generally permanent and completely protective, but there are exceptions to the rule, in regard to each of the above named maladies.

The greater number of contagions, however, are by no means

obedient to this kindly law, whether febrile or non-febrile. Thus psora and ophthalmia may attack the same subject again and again, being indefinitely susceptible of repetition, as often as the efficient causes of their production are re-applied.

Not the least wonderful among the remarkable phenomena we are engaged in tracing out, is the protective and modifying control of vaccine over small pox, the happy discovery of which is among the most valuable contributions of our divine art to the suffering race of man. As protective, this influence is liable to occasional exceptions, but it is I believe an invariable and unfailing and most invaluable modifier. If any thing could add to the obscurity of this mysterious influence, it would be the fact, that vaccine is not, so far as we know, self-protective, but exerts a control over small pox, which it does not possess over itself, being liable to indefinite re-production.

We now approach debatable ground, and must for a moment take a view of the controverted subject of the diffusive propagation of contagious diseases, by which they become epidemic. Why this does not always occur with the impalpable contagions, it is impossible to say; we know nothing of the conditions which sometimes limit scarlatina, measles and small pox, to the production of a few sporadic cases easily traceable in most of the steps of their progress, and of the contrasted contingencies which at other seasons give them wings as it were, and scatter broadcast the seeds of pestilence. But surely it will not be required of me to produce proofs of the fact familiar to every physician, that such differences do occur, in the promptness, facility and extent of the spread of contagious diseases, at different times. All the febrile contagions, except vaccine, as above, are capable of being thus propagated; hence they may be styled diffusive or epidemic. Plague thus prevails—measles—that strange malady, dengue, which shot meteor-like across the Caribbean sea, afflicting the islands of that western archipelago, and the shores of the neighboring continent, for a brief space—dysentery, which begins as a local endemic, from known circumstances of season and locality, as in hot autumns, in malaria regions, assumes sometimes a contagious disposition, and spreads as an epidemic—cholera, the remembrance of which, still terrifies the nations, and hangs like a dark shadow over more than

half the globe, and perhaps influenza, the most widely spreading of all human ailments, the most independent of time, place and circumstance. Yet, with the exception of the last alone, and but partially even of this, all epidemic and diffusive contagions have a limit in their association with cities, and other localities in which density of population, whether permanent or transitory, is met with. From city to city, they spread by slow transmission and casual opportunity, being propagated from neighborhood to neighborhood, or travelling on the great channels of human intercourse—a road or navigable river, either with the bodies of the sick, or in fomites of diversified character, or by means of portions of what is called “infected atmosphere.” This third mode of propagation is much dwelt upon by those who are unwilling to admit the contagiousness of particular forms of disease, and who prefer to ascribe such diseases to unknown and unimagined modes of contamination of atmosphere, rather than acknowledge the possibility of saturating any given body of air with contagious matter evolved from a diseased subject, as we find it often filled with the soft and fragrant exhalations from odorous substances, or the foul and mephitic products of decay and miasmatic fermentation.

The universal occurrence of what is called a latent period—that interval which elapses between the efficient application of the cause of a contagious disease, and its open development, offers the most usual opportunity of transmission of such disease from one place to another. This latent period not only differs much among the several maladies, but even in the several cases of the same malady. After we insert the vaccine lymph under the cuticle, it appears inert until the third or fourth day, generally; then producing some local inflammation, a vesicle is gradually built up, but the system is not disturbed until the eighth or ninth day. Yet all this may be very greatly postponed. I have seen the first changes procrastinated until the seventh day, and there is a case on record in which it was put off for six months.

Small pox, thus inoculated, remains dormant until the fourth day. When invading spontaneously in “the natural way,” some constitutional derangement takes place, for the most part between the seventh and fourteenth. Dr. Whytt was seized with the

plague three days after inoculating himself. Of measles, the latent period is so indefinite that nothing has been fixed on; it is probably about a fortnight. So also of scarlatina. I saw a gentleman from the country attacked with dengue the third day after his arrival in this city, where the disease then prevailed. The latent period of hydrophobia is totally undefined, as you are aware, and has been affirmed to extend as far as six months and even longer. I saw a case in which the bite was given in September, the patient dying in the February following; and a second who died in August, having been bitten in April. Both were children, one of ten, the other three years of age. One was white, the other black; both males. Typhus has an interval, after exposure, of great length at times; but Drs. Marsh, Tweedie, and Gregorie, each give cases of instant affection by the contagion of fever. It has been in vain inquired, what is the cause of these differences. No plausible conjecture is offered beyond a reference to a supposed predisposition, greater or less in degree, or the want of such predisposition, or in a state of constitution opposite to that which is implied in the term. These phrases, however, are vague, and convey no definite meaning. This latent period, whether one of perfect health or not, is sufficiently near a state of health to admit of the subject pursuing his usual avocations and executing his purposes, and if these involve change of place, he must become wherever he is seized with actual disease, a new centre of contagion. Nay, it is perfectly well ascertained, that even a healthy man may in himself, his clothes, his baggage, become a means of transmission to all such contagions as are capable of adhering to fomites. The hair of an individual who has been sitting among tobacco smokers, will convey and retain for twenty-four hours and more, if not cleansed by ablution, a sufficient amount of the fumes of the vile weed, to annoy those to whom it is disagreeable, or even to sicken some delicate persons. Is the impalpable matter of contagion less tenuous, less tenacious, or less impressive than the fumes of tobacco?

In these discussions concerning the contagiousness of certain forms of disease, I am disposed to regard with some degree of surprise the obvious and extreme aversion which prevails in the ranks of the profession in modern times, against the admission

of reasonable evidence in favor of the affirmative proposition. It is not only assumed that the burden of proof lies upon the contagionist, but it is also taken for granted, that all reasonable probability runs so strongly against him, that he requires "an Ossa upon a Pelion of evidence" to support him. It is not so in justice, I think. I would not perhaps go so far as to dwell upon contagiousness as a general incident of disease, but if I proposed any definite rule upon the subject, it should be this: those diseases which in any peculiar or characteristic way affect and render morbid the living fluids, the secretions or excretions, are capable of self-reproduction by the specific morbid qualities of such secretions, or excretions, or living fluids. If these are morbid in their properties, why are they not applicable as causes of disease, in one mode or another? If so applicable, what diseases are they likely to generate? I doubt not that this, like other rules, would be found liable to exceptions, but the inquiry has only just commenced.

It is usual to speak of the matter of contagion as a unit, and of contagious diseases as governed by the same laws, in regard to their origin, history, progress, propagation, and transmission. We are now prepared to set this error in the proper light. We have endeavored to arrange them in series, according to their characteristic qualities, in which we have found them to differ very remarkably. These qualities by their combination, it is evident, must affect very much the facility and promptness with which their dissemination shall go on. We have, however, no means of judging of their comparative force or efficiency. It is usual to take small pox as the example or model, and to speak of all the rest, with an open or implied reference to it. But it seems to me, that we are not thus likely to arrive at the truth. Contrast it, for instance, with the vaccine, pertussis, and with typhus.

In the investigation of the questions which from time to time arise, as to the contagiousness of any alleged malady, we are too apt to be referred to small pox as a standard. If there be any such standard,—if there be any satisfactory tests, it is proper we should know them, let us therefore inquire.

1. Inoculation may be mentioned first, as the *experimentum crucis*; when it can be applied repeatedly, no room is left for

doubt. But in how few contagious diseases is the matter of contagion secreted in any palpable form. The disgusting experiments of Ffirth, Chervin, Foy, and others, have led here to merely negative results, of the actual value of which it is unnecessary to say any thing.

2. The greater liability to seizure upon near approach to a patient laboring under a given malady. This is evidently a well founded requisition, and probably the most important of all. It is an obvious corollary, that every subject may become a centre or focus of contagion, and that his friends, nurses, physicians, attendants, visitors, neighbors and fellow-citizens, shall be notably liable to be attacked in a similar way. But we must take care on the one hand, not to be led to mistake local endemics for contagious affections, and on the other, to allow for occasional or apparent exceptions to the application of the rule. We distinguish local endemics, although the subject is apparently a centre of similar disease, by observing the collateral circumstances, and remarking that their coincidence is absolutely necessary in the production of these effects, and that the disease cannot be extended beyond the influence of these contingencies, whatever they may be, whether referring to season, climate, or locality, geographically or geologically considered. Of course, I cannot enlarge upon this subject in detail, but must give an instance or two, to be understood. An individual is seized with intermittent or remittent fever in a certain situation, and at a certain season of the year, and remains at the spot where he was attacked; all who resort thither to aid and attend him, and all his household sicken in like manner—but if he be removed to another locality, his attendants escape altogether, and he himself is not attacked at other seasons of the year. Therefore, these fevers are not contagious. But a man is attacked, somewhere, with typhus fever; he is removed to a hospital; the fellow inmates of his ward are attacked—his nurse, his physician, all of them remote from the causes which affected him. He is, therefore, a centre of contagion. But as this may happen accidentally, that is to say, from causes that escape our notice, we wait for a repetition of the same extension, under varied contingencies, before we pronounce a positive decision, which having once arrived at, we shall not readily yield. In this country, I

mean in our warm climate, and with the free ventilation habitual in the dwellings even of the poor, it is not impossible that a physician shall pass through a long life of practice, without having had an opportunity of observing for himself the contagious influence of fevers; nay farther, such an one, as I have heard many declare, may watch in vain for any facts which shall seem to him to indicate the existence of such an influence in fever of any kind. What then, shall he do? Shall he deny the doctrine of their contagiousness, and rest himself upon his personal experience exclusively, or shall he follow the received rules of reasoning, and accord to extraneous testimony its proper weight. Surely an intelligent and conscientious inquirer after truth will prefer the latter course, and will diligently endeavor to ascertain on which side the evidence preponderates. He will give the proper preference to positive over negative observations, making due allowance for the liability of the witnesses to mistake the alleged facts. He will inquire, which among the witnesses had the best opportunity for enlarged observation, and will endeavor to find out any bias or partiality that may warp their judgment, or color their statements of fact. I have had but once, any occasion to observe for myself, the contagiousness of idiopathic fever; this was in typhus, as I shall by and bye tell you. But I feel myself constrained to admit the doctrine as established beyond question or cavil, by the recorded testimony; among which I refer you to the statements of Tweedie, in regard to the London fever hospital, as specially pointed and forcible.

Great diversity of sentiment is met with as to the stress which should be laid upon apparent exceptions to the applicability of this rule. These exceptions are numerous in all contagious diseases. We vaccinate often in vain, though the lymph is inserted with care. Inoculation with small pox matter often fails. Exposures to the closest contact fail to affect in small pox, in measles, and indeed in every example of acknowledged contagion. Yet, strange to say, we are every day startled with the remark from some practitioner, that he does not believe the contagiousness of a certain malady, because at such a time, and under such circumstances, it failed to attack all or any one of those exposed by near approach.

It is important to notice here, the question—at what stage or

stages of its progress does a contagious disease exhibit this property? It is unnecessary, surely, to remind you, that at least, the febrile contagious diseases are not actively efficient throughout their whole existence. It is not until they arrive at a certain point that they become so; and after attaining its maximum, this contagious power undergoes a gradual diminution, and is more or less slowly extinguished. Small pox is believed to have two contagious stages, in which it stands alone; the first being when the eruptive fever is at its height—the second, after perfect maturation of the pustules. This latter, I regard as doubtful, for it is not proved, that the palpable matter of small pox is any more diffusible in the air, than that of vaccine. I believe its diffusion to result from an entirely separate impalpable contagion, thrown off in the eruptive stage in greatest quantity. Measles have been supposed, and it seems to me with good reason, to be most vehemently contagious, if not exclusively so, during the cuticular desquamation. Cholera does not probably develope or diffuse any contagious matter, unless in cases where some degree of reaction has occurred, and its peculiar febrile effluvium has been eliminated. This remark, as to stages, deserves a little farther notice. Suppose a subject of typhus, attacked with a chill, and dying in that condition; he could not become a focus of contagion. A very large proportion of cases of cholera, (which I look on as a fever,) die in the analogous stage of invasion or congestion, or are arrested at, or just on the point of falling into this stage. Now, such cases cannot properly be expected to exhibit the contagious property—the matter of cholera contagion is produced in the progress of the disease—is the result of a series of characteristic morbid changes, and is not elaborated until after some protraction of the disease.

To sum up, then, I would admit the contagiousness of any disease, under the following conditions. If in repeated instances under the notice, and by the report of competent observers, a single case had been the fore-runner of a number of others in the immediate neighborhood, provided the circumstances of season and locality had been sufficiently varied to remove it from the circumscribed list of endemic maladies—if it showed an evident disposition to confine itself within the limits of a dense population, for thus only can we distinguish contagions from

the mysterious class of imagined epidemics—if a household or neighborhood, previously healthy, were attacked in succession, after the importation of a case from a distance, or after the admission of any of the substances known as fomites, including infected air of acknowledged contagion—if those escape who avoid such fomites or cases of disease.

I would not refuse to admit the contagiousness of a disease, as many do, upon the grounds here alleged, of the correctness of which you are now prepared to judge.

If it appeared to arise spontaneously. All must have thus begun; many begin thus under our own eyes; fomites may be very obscurely the causes of such apparent spontaneity.

If a case or cases terminated without affecting those exposed. This occurs often in contagions of undisputed character and remarkable intensity. A contagious disease, as already observed, may give off no contagious matter, from the quick termination or impeded or modified progress of the morbid actions necessary to produce that result. The subject exposed may be oppositely predisposed; may be guarded by caution, saved by accident, or protected by counter-agents; if, as is so much urged, those at some distance be as liable to attack as the neighbor or attendant. This may happen whenever the contagion is diffused or epidemic, in the true sense of the word. Besides, the nearest persons may not be the most predisposed, and the chances of seizure are obviously in a compound ratio of exposure and predisposition. I need not comment on the irrelevancy of objections founded on the assumption of alleged properties, which do not belong to the individual disease under consideration, nor even perhaps to the class among which it is enumerated; as the attempt to inoculate, or to infect by swallowing, when there is no palpable secretion of contagious matter. It is not certain that all contagions are absorbable by fomites, and they may differ too in reference to the mode of atmospheric contamination, whether by mere diffusion, or by some unknown power of poisonous assimilation.

Counter-agents of contagion have been eagerly sought for in every direction. There are three which authors assert to have stood the test of experiment—lime, chlorine and heat. I should place most confidence in cleanliness, ventilation and abundant

washing. The walls and ceiling of an infected apartment should be well whitewashed. I am doubtful of the efficacy of the chlorides or chlorine, except in union with lime. High degrees of temperature are alleged to be destructive of the matter of contagion. All should be warned against the vulgar mistake of substituting for ventilation and ablution, as preventives of infection, strong odors, so commonly resorted to, such as camphor, vinegar and the like. They are of no advantage whatever. The segar would promise more benefit, if the inlet of contagion were by the deglutition of saliva, as has been imagined of malaria and certain other causes of disease. But this has not been made out, nor do I know of any authentic facts which go to prove the utility of tobacco in this way.

To prevent the spread of contagion, its propagation from subject to subject, and its transmission from place to place, is obviously a matter of infinite importance ; and a physician can hardly engage himself in the discussion of any topic of warmer or more urgent interest. It is our duty, fearlessly and with decision, to point out the measures proper to be followed ; it is that of individuals and communities to institute and enforce them. If a contagious disease, making its appearance in any city or town, should attach itself to a limited locality, the population of that infected district should be forthwith removed, and all visits to it prohibited. None should be allowed to approach a patient ill of contagious disease, but those whose attendance is necessary, or whose relationship to him constitutes an indissoluble bond of sympathy, and obligation of self-sacrifice. The danger of desertion of the miserable sick, in such cases, is vastly increased, if we abstain from an open and manly exhibition of the real degree of peril. Terror is always augmented by mystery. This rule of non-intercourse should be specially observed among children, and in boarding schools and colleges. There is no fear that the sick will suffer from want of comfortable attendance, if our profession does its duty. Ambition, avarice, benevolence—these motives can be set in action ; and if the unhappy sufferer has no friends, or is abandoned by them, let him be attended by hirelings and professional nurses, over whom there will be always—let us not doubt it—a sufficient official, medical and benevolent supervision. The days of ignorance and superstition, in which the dread of a reputed pestilential or contagious disorder,

drove the husband from the wife—the brother from his closest kindred and nearest friend, and even—Heaven wept surely then, for human nature!—the parent from the child!—these dark days of stony selfishness have fled for ever; and it is now rather the office of the police to restrain and separate the kind or curious from the miserable sick.

As to the transmission of contagious disease from one place to another, it is a matter of exceeding difficulty, if not actually impossible, to prevent it, in this period of free intercourse among all nations for purposes of commerce and pleasure and necessity. Yet, it is not only the right, but the positive duty, of all communities and governments, to make the attempt, and its success, however partial it may be, abundantly repays all the inconvenience and cost. But what shall we say of the quarantine regulations and restrictions established throughout the extended frontier of our country by sea and land—their absurd vacillation—their irrational inconsistency—their notorious inefficiency? How futile must be the effort to evade the introduction of a contagious distemper by sea, when the pilot who brings the ship into port, and the physician who examines her and declares her infected, may themselves return, after exposure, into the very heart of the protected city—their boats' crews the possible subjects of an impending attack—their clothes the fomites to infect others. Let quarantines be at once abolished, or instituted rationally, and their observance despotically enforced and with the utmost exactness. Let a comfortable lazaretto establishment be prepared, sufficient to afford ample accommodations. Let an infected vessel be stopt there—her cargo discharged—her sick received into a hospital and supplied with every humane attention; those who are well, separated from them, but for a time insulated. Let all who have had intercourse with the unfortunate remain also at the lazaretto, prevented from mixing with the population around until all actual disease shall have ceased for some time—say forty days, a quarantine; and ablution or destruction of every thing capable of acting as fomites have been faithfully carried into effect.

Superfluous regulations of the restrictive character, have often been stigmatized as cruel; the imputation will lie more correctly against such as are inadequate.

CHAPTER VI.

ENDEMIC AND EPIDEMIC.

FROM the earliest date of its records, history contains numerous examples of the occurrence of disease, widely prevalent for periods of greater or less duration, both among men and animals; the first known as epidemics, the latter as epizootics, significant terms derived from the Greek. These plagues were more or less limited in their extent, and more or less fatal, proportionally at different times; but appeared so obscure in their origin and history, and constituted so terrible an infliction, that both priests and poets as well as the vulgar, were disposed to refer them directly to the wrath of the angry gods—the arrows of Apollo; or to the malignant potency of some imaginary monster as the Lernean hydra.

Even the more scientific and curious moderns have been foiled by this obscurity, and in regard to a great majority of the forms of general pestilence, seem willing to rest in a profession of ignorance as to their cause and generation, and attribute them vaguely to an undefined and indefinable vitiation of the atmosphere—"an epidemic constitution of the air." Some have sagely laid down the "laws of epidemics"—others have ventured to offer certain conjectures or hypotheses as to the nature of this alleged atmospheric contamination. Planetary influence, volcanic eruptions,—telluric effluvia, and insect or animalcular agency, have all been brought forward and advocated, as the sources of this class of disease. The subject is of high interest and deserves from you a more lengthened and closer investigation than my limits permit me here to go through. It must receive, however, all the attention that we are able to bestow, consistently with our other duties and obligations.

I shall treat in this connection successively 1st, of endemics; 2d, of local epidemics, as they are called by writers of recent times; and 3d, of general epidemics; endeavoring, at the outset, to define more precisely than is usually done, the terms employed.

1. By the phrase "an endemic disease," then, I recognise any

malady, which occurring with special frequency in any one locality in a permanent way, proves the existence in that locality of an agency of a peculiar nature, whether known or unknown, efficient in its production. Thus yellow fever is an endemic of Vera Cruz, Havana, New-Orleans; bilious remittent in all our low alluvial country; intermittent fever in Holland; goitre in the Valais; pellagra in Lombardy; milk-sickness in some of our western districts; scrofula, if we believe Dr. Young, is endemic in Great Britain.

2. Local epidemics have been often confounded with endemics, but are readily distinguished by reference to the permanency of the cause which gives rise to them, whatever it may be. Thus, yellow fever, which at a certain season of the year is always ready to be generated in a fit subject at Havana and Vera Cruz, is occasionally, though rarely, epidemic at New-York, Boston or Philadelphia—in which places, when it occurs, it is singularly local and confined to very narrow spots or “infected districts.” Typhus fever, pneumonia typhoides, dysentery, may prevail at distant intervals in any community; and even diseases whose contagious power is undenied, as small pox, measles, scarlet fever, etc., sometimes spread so very generally through a dense population, as to have been regarded in the light of local epidemics. By almost all writers of the last age in Great Britain,—Bateman, Duncan, Currie, Haygarth; and by many of the highest authority of the present day,—S. Smith, Alison, Tweedie, etc., fevers of the contagious character, are often spoken of under the appellation of epidemic. The cause which gives this wide spread prevalence does not, it is confessed, act always; at least does not always act with efficiency.

“The contagion of measles, scarlet fever or hooping cough, like that of typhus,” says an ingenious author, “is never wholly extinct in any country, yet these diseases only prevail epidemically during particular seasons; it, therefore, becomes a very interesting point in medical physics, to determine the reasons why they spread some years so much more than others. We have met with no satisfactory solution of this curious question. The phenomenon, we fear, cannot be explained, and we must be content, in our ignorance, to refer it to the influence of what was styled by Sydenham, and the older physicians, ‘peculiar consti-

tutions of the air,' during certain years or portions of years, disposing the body to take on one kind of disease in preference to another."

We have here a distinct expression of the belief in some occult quality of the atmosphere, having no relation to cognizable conditions, barometrical or thermometrical—not to be detected by our scientific apparatus of eudiometers, hygrometers or electrometers; and this doctrine has been received as an ultimate and established fact. Sydenham, perhaps, utters the sentiment of the majority at the present day, in referring it to a telluric source. "It proceeds," he says, "from a secret and inexplicable alteration in the bowels of the earth, whereby the air is contaminated with such effluvia as dispose bodies to this or that disease as long as the same constitution prevails, which, at length, in a certain space of time, withdraws and gives way to another." Local epidemics, however, are almost always attributable to some obvious cause, whose influence is limited to the situations in which they appear, and may be detected and pointed out upon careful examination of all the concurring circumstances, such as the temperature of the season, the previous and present state of the weather as to dryness or moisture, the stagnation of the air from infrequency of winds or tempests, the prevalence of particular winds of known or special quality, the deficiency, perhaps, and perhaps the superabundance of the electric fluid, the decomposition of vegetable substances by which a subtle and malignant effluvia is produced, recognized as marsh miasm or malaria, and, lastly, animal putrefaction. Of these two, I have already treated in detail; at present, it suffices to refer to them as causes of the various forms of fever, hepatic disease and dysentery, the most familiarly met with of all the examples of local epidemics.

3. General epidemics present some of the most wonderful and unaccountable as well as most interesting events that occur in the history of our race. The sources whence they arise, and the laws which govern their appearance and progress, are the themes of inexhaustible discussion, and are, in many instances, enveloped in perplexing obscurity. They cannot be dependent for their origin upon the local influences which I just now enumerated under the preceding head, for they prevail under every possible diversity of circumstance and situation, not only inde-

pendently of, but actually bidding defiance to, all known contingencies. Such was the *black death* of the fifteenth century, which spread itself rapidly over all Europe, including in its ravages every variety of country and constitution. Such, in our own time, is the malignant Asiatic cholera, that, like the prophet's cloud, "at first no larger than a man's hand," has covered with its dark shadow almost the whole of the habitable globe, and swept off millions into the tomb. Arising in Bengal, it extended itself slowly over eastern India, invaded the vast empire of Russia, striking many parts of Germany, and adding the last bitter drop to the miseries of unhappy Poland. Nor seas, nor deserts, availed to arrest its career. It depopulated the crowded streets of Cairo and Constantinople, and whitened, with the bones of armies of pilgrims, the sandy plains which surround the holy cities of the prophet. England and France, enveloped in all the safeguards that science and art can offer for the protection of man from physical calamity, enjoyed no exemption, and the waves of the broad Atlantic presented an insufficient barrier. The sea-coast and the vast interior of our own beloved country, our lakes and the banks of our majestic rivers, have scarcely ceased to mourn its presence; it lingered long upon the south-western portions of our continent, and even yet our cities are depressed with the terrors of its repeated and deeply dreaded invasion. Its victims were multiplied fearfully at Naples and in Palermo, and its mortality every where awfully great, seemed more frightful than ever at the foot of *Ætna* and of *Vesuvius*.

Influenza, or epidemic catarrhal fever, is the most frequent and least dreaded of all this class of maladies—a recent modification of which, known by its French title, "*la grippe*," extended with a steady, though by no means rapid progress, on all sides of its original centre at Paris. Whatever may be the cause of influenza, it is either endowed with singular promptness of communication, or acts simultaneously at distant points. The disease so familiar to us under this appellation, shows itself with no obvious interval of time, all over the United States, and is affirmed to have occurred at once in Europe, Asia and America.

I am somewhat doubtful whether it is proper to include under the present head, our American epidemic, the pneumonia typhoides, spotted fever, (*febris petechialis*,) cold plague, which

beginning in New-Hampshire, in 1806, extended in successive winters a gradual progress over the greater part of the Atlantic coast, some of our interior country, and even a portion of Canada, including within its range every variety of locality and constitution.

An attempt has been made by the learned and indefatigable Webster, to trace a connection between the access of epidemic forms of pestilence, and the appearance of comets, the eruptions of volcanoes, and the occurrence of earth-quakes. But even if a coincidence in point of time be actually made out by such researches, they will afford us no aid in our ultimate investigations, nor tend to establish on any intelligible grounds, the doctrine of the relation of cause and effect, between these magnificent and terrible phenomena.

Having thus separated these three forms of disease by obvious lines, and traced out briefly the characteristic peculiarities which distinguish them, let us return to our difficult task, and endeavor to ascertain, if we may, the nature of the causes to which they are attributable.

1. Endemics are sometimes clearly owing to the particular circumstances of local situation. New-Orleans, for example, built upon a low alluvial soil, soaked with moisture and incapable of drainage, with a turbid river in front, and an indefinite expanse of morass and forest all around her, is destined to suffer all the physical evil which a burning sun, and an atmosphere loaded with every varied product of vegetable decay, can inflict. A poisonous and impure water must generate disease, the character of which will be modified by an infinity of circumstances; but experience soon teaches us what the influence of these is likely to be, and therefore, what maladies we may expect they are to develope. Similar heat, moisture and malaria, are said, in our western hemisphere, to bring into existence yellow fever; in the east, hepatic disease—in both, dysentery. It might be difficult to say why yellow fever should not prevail in Hindostan, as it does in South America and the West Indies. Among fevers, some types attach themselves to particular localities, becoming endemic in the strict sense of the word. Armstrong says, that typhus is perennial, in St. Giles', where he attributes it to the want of ventilation and extreme impurity of air; it is

also endemic in many of the Irish cities, where it is ascribed to deficiency of nourishing food, and often indeed, called the "famine fever."

We may class among endemics, the "milk-sickness" of the western and south-western districts of our own country, already alluded to, the history of which will by and bye engage our attention. The nature of this endemial epizootic, is not much more clearly known than its source or cause, both being still matters of unsettled inquiry. So of the bronchocele or goitre of the Swiss, and other mountaineers—the endemic idiocy or cretinism of Sion, and the valleys generally of the Alps—and the pellagra of northern Italy. So of the yaws of the West Indian black, and the sibbens of the Scotch, the tumid leg of Barbadoes, the trismus of Santa Cruz. But these instances shall suffice.

2. Local epidemics have, some of them, just been enumerated under the head of endemics. It is not every disease peculiar to a given locality, which possesses or can exert the power of spreading itself, at one time more than another. The endemics differ among themselves, relatively to their cause and nature. All the febrile are thus capable of occasionally extending themselves, with an indefinite promptness and force, limited in extent, however, by the boundary of special local circumstances. In our own city, yellow fever may show itself sporadically, affecting a single stranger or a child; on another occasion, it may seize upon a few individuals; and again it may pervade our whole atmosphere and affect all, or a large majority of those liable to it. But there are certain limits which it never overleaps. It never attacks adult natives or old residents—it never marches into our interior country. We say then, correctly, it is an endemic, it is sometimes (rarely thank Heaven!) a local epidemic; but in no sense is it a general epidemic. Still more emphatically is it a "local epidemic," when it appears in some of our northern cities, where it would not be permitted for a moment to regard it as indigenous or endemic. In New-York, for example, where there is no known class of "exempts," it will occur in a particular section of the city, designated then, as "the infected district," prevailing there with universal and mortal sway, but restraining its ravages within these defined boundaries, whence all the residents are driven into the uninfected wards.

We may use with the same propriety, similar language concerning our ordinary bilious remittent, though the special history of the two types of fever be so widely different. Yellow fever is met with here and there, in well defined regions, few in number and easily enumerated; it is almost exclusively (I acknowledge some exceptions,) confined to the sea-coast and to cities. Bilious remittent, on the other hand, prevails over almost the whole world. Wherever a hot sun, stagnant moisture, and vegetable life are found together, it is endemic; in all such places it is occasionally epidemic, that is, it pervades the atmosphere with unopposed sway, disregarding all favorable or unfavorable conditions of the individuals attacked, all the adventitious aid of transient or exciting causes, all the *juvantia* and *lœdientia*. But it is never absolutely or generally epidemic. There are some sections of country which it has never invaded, and which are known to be entirely free from its intrusions. These insulated spots owe their exemption, in some cases, to elevation—in some to a happy condition of temperature; in others still, to a fortuitous but blessed purity of air and waters.

I have already alluded to the remarkable fact, that contagious diseases of the febrile character, become thus locally epidemic. With respect to the class of endemics, we may, by careful investigation, usually discover some reason why they should at any particular season undergo a notable extension. Thus, in reference to the whole series of maladies which arise from malaria, knowing, as we do, the three constituent circumstances which develope and give them energy, we become aware of their danger, and are able to trace effects to their causes. If the atmospheric temperature be unusually high, or the hot season be unduly protracted; if in some situations where vegetable material abounds, an inordinate quantity of moisture be present; or if by drought or any accidental circumstances, decaying vegetable matters are peculiarly exposed in other situations, we can calculate upon certain results.

But we cannot reason thus concerning the contagious epidemics. We cannot even offer a plausible conjecture, why measles, or small pox, or scarlet fever, or sore throat, should sometimes attack but few members of a given population, and again when introduced, should spread with a contrasted rapidity so widely.

The "constitution of the air," is Sydenham's phrase, and is still used, but without definite meaning, to denote the fact that such diseases are liable to such variations in their history.

We know little or nothing of the *juvantia et lædencia*, which may affect the progress of the contagious epidemics. We talk, indeed, of predisposition and of exciting causes but vaguely, and ignorantly. What, for example, can we even guess of the circumstances likely to promote the eruption of the dengue, which in less than six weeks from the date of its invasion, had attacked three-fourths of the population of our city. It would require a minute and penetrating sagacity, to point out what were the constitutional peculiarities which characterized the small portion who escaped, or what modes of occasional excitement had brought on the disease, in those who were seized with it, not having been exposed to immediate contagion by near approach to the sick. Yet this is the problem we are called upon to solve, and the only solution upon which my mind can rest for a moment, with any degree of satisfaction, is suggested by the history of the class of maladies now under consideration.

Every effect must be traced to a cause; every specific disease must be traceable to a specific cause. Of small pox, but one notable cause is recognized—the contagion which itself generates; so also of most of the other febrile diseases confessedly contagious, the exanthemata especially. Now, these become sometimes epidemic and spread widely; the contagious matter, to which alone their attack is ascribable, must in such instances be widely diffused, preserving its efficiency. Here, then, we have something to rest upon; we have comprehended one of the modes of epidemic diffusion of disease, and the obscurity of our subject is somewhat diminished.

Again, let us enter upon the debateable ground, and consider the case of the ordinary fevers of Great Britain, admitted by the majority of writers of that country to be contagious, as well as endemic, and of typhus, universally recognized there as contagious. Few can be found to maintain that these arise exclusively from contagion; the possibility, nay, the frequency of their development under peculiar contingencies, may be assumed as generally admitted. These contingencies have also the power of predisposing causes, and hence, when they are present,

forcibly active, or widely diffused, we can easily account for the epidemic prevalence of these forms of fever. A strong degree of predisposition existing, the disease will be developed by a small dose of the contagious poison; or if circumstances retard and restrain the diffusion of the contagious matter, the second set of causes alluded to, will create the disease in several points where they find fit subjects.

For myself, I have no hesitation in following out the analogy whithersoever it may lead me. We have ascertained two great sources of epidemics—malaria, understanding that term in its most comprehensive sense, and contagion. Whenever I cannot trace the first, I am disposed to refer to the second. Nature is full of mysteries. Let us not add to the number by our prejudices—let us not dwell in darkness rather than accept unpleasant revelations from the light. I know that nothing is more unfashionable at the present day, than to intimate the possible contagious property of any malady which cannot be communicated by inoculation; but I refuse and reject this coarse test, and will continue to apply all other modes of investigation within my reach—satisfied often as fully by a reasonable and logical inference, fairly and carefully drawn, as I can be by the chemical or mechanical results of any experiment.

3. The general epidemics of modern times are few in number, and may perhaps with advantage be studied somewhat in detail. Influenza and cholera stand at the head of the list, as prominently gifted with the peculiarities which characterize this terrible class of diseases; existing and spreading over all diversities of soil, climate and locality, defying all extremes of temperature, and assailing promiscuously all the tribes, nations and varieties of the human race. Influenza is not properly an endemic anywhere; it often prevails in limited situations as a local epidemic. Cholera originated, as you all know, in a district of Hindostan, near Calcutta; whether it is truly an endemic there, I will not say; if it existed as a local epidemic any where, its malignant potency soon burst all local restraints. Many of the endemics and local epidemics, indeed, have from time to time overleapt their usual barriers, and extended themselves so widely as to deserve notice under the present head. The plague, a contagious endemic of Asia and Africa, has several times invaded Europe,

and devastated some of her most flourishing cities. It is somewhat under the control of temperature, and prevails almost exclusively in low latitudes ; but even in this matter there seems something anomalous ; for while it has never been met with between the tropics, it has more than once penetrated as high as London and Paris.

Geographical distinctions of a similar nature seem to be observed by several others of the forms of pestilence. Yellow fever, for example, prevails frequently in North and South America, and is supposed to have originated in Africa, where it is said to be of common occurrence. In all these positions it is either recognised as endemic, or assumes the character of a local epidemic ; but so far from being absolutely or exclusively controlled by the limitations it seemed thus to have pointed out for itself, it has repeatedly crossed the Atlantic, and struck terror into the southern portions of Europe, by a universality of diffusion and a malignant mortality, equal to its worst inflictions in climates supposed to be most adapted to it.

Like the plague, yellow fever belongs only to the heat of summer, and is extinguished by frost.

2. In contrast with them, in this respect, stands our American epidemic, the *febris petechialis* of northern writers—the cold plague of our southern country, better known now as the *pneumonia typhoides*. From New-Hampshire to Georgia inclusive, and from our inland lakes to the Atlantic, its ravages comprise a great diversity of condition and locality ; but it was arrested by the genial warmth of summer, and revived during successive winters, to subside at last, leaving at present but few and indiscreet traces.

Last of all, I will refer once more to that strange exanthem, the dengue, whose brief existence occasioned so much suffering, with a rate of mortality unprecedentedly small in the history of disease. It is first noticed near Calcutta ; in St. Thomas' next ; whence it spread over several of the West India Islands, and reached this continent in a few months. It died away in early autumn, having affected our southern cities, each for a short period. Since that time it has never been heard of. It was a contagious epidemic ; but of its source no one knows any thing. It was conjectured to have been brought from Africa to St. Thomas.

Let us examine, for a moment, the various hypotheses and speculations brought forward to account for the appearance of these forms of pestilence. They have been attributed to heat, cold, prevailing winds, and a variety of other such agents; but it will be readily perceived, on referring to the essays on these points, that the reasonings made use of apply exclusively to certain localities, and must farther be acknowledged to be defective and unsatisfactory even as regards these. When an endemic becomes epidemic, and when a local epidemic overleaps its original boundaries and becomes a general epidemic, this can only occur from a diffusion of the agent which has caused it, and an extension of its poisonous influences. If any such malady, then, appears to prevail under opposite or contrasted conditions of cold, heat, dryness, moisture, and peculiar winds or defects of winds, and obviously beyond the scope of notable exhalations, animal or vegetable, such as are developed by the various sources of malaria, it is clear, that we must not attribute it to these limited causes of evil. But it is just such circumstances that constitute the difference between a local and a general epidemic.

Some atmospheric contamination is very commonly referred to in these discussions, but few seem willing to attempt to define it even conjecturally. There are, for example, several chemical substances capable of assuming a gaseous form, which, when applied to the respiratory mucous membrane, produce an irritation resembling catarrh. Suppose such an ærial matter extensively mingled in the atmosphere, and we should have a species of influenza wherever it spread itself. Such is chlorine, and such are selenium and its compounds with hydrogen especially. But chemists detect nothing of this sort in an epidemic atmosphere. Whence, indeed, could these products arise? We know of no large chemical laboratories in operation naturally except volcanoes, and influenzas are not more frequent or violent in their neighborhood than elsewhere.

Sporadic catarrh is, perhaps, the only disease which it is in our power to excite or develope without the employment of a specific poison. Let any healthy individual sleep in damp streets or sit in a current of damp air, or on the ground in a chilly night, and the probability is very great that he will be seized with catarrh. Some persons are affected with it in all changes of weather.

Now, the relations of the several qualities of air to each other, especially in its combinations with aqueous vapor, are beginning to be so carefully noted and so much better understood by chemists and natural philosophers, that I scarcely hesitate to expect a full solution of the frequent appearances of influenza or epidemic catarrh, from the future and more minute observations of meteorologists. But as I have said, this disease stands alone.

All the other modes and forms of general pestilence have been alleged to be of contagious character, and if this point be made out, we can have no difficulty in comprehending their phenomena; for, contagion, though more active under certain circumstances, and at some times than others, is capable occasionally of bidding defiance to all understood impediments, and of continuing pertinaciously its destined progress. When we understand better the minute chemical and meteorological changes which take place in the air about us, we shall be able, doubtless, to say why a contagion which spreads rapidly and becomes epidemic at one time, shall, at another, fail to extend itself except by contact or near approach.

Prout tells us, that having been engaged in a series of nice experiments to determine the weight of a given portion of atmosphere in London, he suddenly found its specific gravity to undergo a notable, though not very great, increase. It was just at this period that cholera invaded the city, and he plausibly enough infers from the coincidence in point of time, that between this superadded substance, the nature of which he failed to detect, and the terrible pestilence that ensued, there existed the relation of cause and effect. Suppose him to be correct in this, although no similar observations were any where else made in confirmation of his, and we are still at as great a loss to determine upon the origin of this heavier ærial matter. If he suggests, that it was a telluric emanation, I object that the disease occurred above and upon all possible diversities of soil, rock of all varieties, alluvial deposit, clay, lime, black loam and sand, and that it was even met with at sea, and in Russia when the earth was ice-bound and covered with snow.

It would be difficult to maintain the possibility of an identical effluvium under all these varied conditions of soil, place and

temperature. No one has imagined a volcanic source for the cause of cholera; the spot where it commenced is as far as any other on the earth's surface, from any known volcano, active or extinct. No earthquake announced its coming; no meteoric phenomena attended the approach of this scourge. In some places it was foreshown, as we are told, by myriads of insects hovering over the devoted heads of its victims; but, if we give all the required weight to these statements, we cannot attribute it to their agency, because, in a large majority of other places, they were not seen—they did not indeed exist. In some localities, a sort of warning, it is affirmed, was given of its dreaded invasion, by the increased and still increasing malignity of its connate maladies, diarrhœas, dysenteries, and all other bowel affections. This we do not deny; but it is equally true, that in many other places its appearance was sudden and unexpected as the bursting of a thunder cloud. Some of its seats were affected at the time of its access with a variety of malaria diseases, and many, perhaps, were attacked at the usual season of the prevalence of such diseases. This is true of New-Orleans, Havana, and many of our Western cities; but no one will assert it of Moscow, Hamburg, Paris or Edinburg.

If it be proved that a ponderable agent, such as was detected by Prout, is the cause of cholera, why may it not consist of a solution of the matter of contagion. It is not ordinary malaria, nor a volcanic nor telluric emanation, nor a cougeries of animalculæ; no chemical properties are attributed to it, unless we are to believe the stories of the more ready putrefaction of animal matter, during its presence—half told indeed and not proved at all; no sensible quality ascribed to it but weight—and this must belong to the matter of contagion. Matter may be dissolved and diffused in the air in a state of the most incomprehensible tenuity, and yet preserve the specific qualities belonging to it; a familiar example of which may be referred to in the fragrance of flowers and other odoriferous bodies, and magnificent instances recalled to your memory as occurring in 1782 and 1783, when the atmosphere almost over the whole globe, was filled with a coloring or colored matter, which tinged the sun light and the moonbeams of a reddish hue; and in August, 1832,

when the whole air assumed a greenish tint. These phenomena were at the time themes of high discussion, and were by the superstitious supposed to prognosticate wonderful things.*

The contagion of small pox, we know, spreads itself at all times a few inches, or a few feet from the diseased body; sometimes fills the chamber of the sick—sometimes infects the air of a whole city. This is the diffusion locally epidemic—of the matter of contagion. Upon what principle does any one venture to deny the possibility of its farther diffusion to an indefinite extent. It seems to me fair and logical to follow out the analogies offered us by the ascertained and undisputed facts which have been referred to, and to conclude that a diffused contagion is the true source of this wide-spreading epidemic.

The same reasonings will apply to the case of plague, measles, sore throat, scarlet fever, etc., when they spread beyond their usual limits, and assume the character of general epidemics.

Much has been said of the laws of epidemics, but no confidence is to be placed in the doctrines, so positively laid down on this subject. Each individual is *sui generis*; arises, progresses, and is limited in its own peculiar manner. Some as plague, pneumonia typhoides and yellow fever, are under the control of temperature; others are entirely independent of such control. Some are confessedly contagious; others are by a large majority of writers denied this property, as yellow fever and influenza. Some are locally epidemic, as typhus—others present in their history no reference to place, as measles and scarlatina.

Among the laws so dogmatically laid down as governing epidemic diseases, much stress has been laid upon their supposed exclusiveness. They are affirmed “to bear like the Turk no bro-

* “In the year 1782, and still more in the year following, a remarkable haze spread over the whole of Europe. Seen in mass this haze was of a pale blue color. It was thickest at noon, when the sun appeared through it, of a red color. Rain did not in the least degree affect it. This haze is said to have possessed drying properties, and to have occasionally yielded a strong and peculiar odor. It is also said to have deposited in some places a viscid liquid of an acid taste and an unpleasant smell. About the same time, there were in Calabria and Iceland, terrible earthquakes, accompanied by volcanic eruptions. Its dispersion, in the summer of 1783, was attended by severe thunderstorms. During the above-mentioned year, an epidemic catarrh or influenza prevailed through Europe, affecting not only mankind, but likewise other animals.”—*Proust's Bridgewater Treatise on Meteorology—effects of foreign bodies in the air.*

ther near the throne." "They drive out," says Rush, "all other diseases, or compel them to wear their livery." If this be a general rule, the exceptions are extremely numerous and striking. Yellow fever and bilious remittent, prevailed in this city together, in 1827, and each of them to an almost unprecedented extent. In New-Orleans and Havana, cholera and yellow fever pursued their ravages simultaneously—and so far as is known, without any modifying influences upon each other.

It is affirmed, also, that without any observable change in the appreciable qualities or conditions of the air, they exhibit a regular tendency to their own decay and extinction. "Entering," says an American writer, "like the lion, they retire like the lamb." And this peculiar trait, as it is considered to be, is attributed by some to the influence of habit on the constitution, which becomes accustomed to the presence and excitement of the malignant cause, whatever we may suppose it to be. At any rate, the doctrine, if true, must be taken as the expression of a fact which relates to the condition of the subjects of a pestilence, rather than to any quality or property, or characteristic of the disease itself. There seems to me, however, nothing peculiar in this matter, nor can any general law be laid down which shall include a majority of epidemics. Thus, yellow fever does not subside at all until the heat of the season has passed by; typhus continues to rage as long as the favorable or fostering conditions which gave it prevalence are present; measles, hooping cough, small pox, etc. as long as they find subjects. If a greater number are attacked when the disease first invades, it is because no means of evasion are attempted for a while, and because there are a greater number then ready to receive it. But, in all the histories of cholera and the plague, there is a gradual, but not a regular progress, from bad to worse. Look at the bills of mortality of 1836, and you will find the number of deaths from cholera in our city continually vacillating; nor did it reach the greatest amount until it had been six weeks among us. Even then, its subsidence was not regularly progressive.

I have said, that I believe "the epidemic constitution of the air," in any given case, to consist in the contamination of the affected atmosphere by the diffusion in it of the material cause of the pestilential disease, whatever that may be.

Thus, an endemic or malarious disease may become epidemic, and, thus, in no other way, can a contagious disease become epidemic, either locally or generally. There are many who employ the phrase "infected atmosphere," who carefully repel the suspicion of acknowledging, as to the majority of epidemics, the possibility of a contagious affection or contamination. Let us take an example. The atmosphere of a rice field is at this moment, (August, 1839,) capable of exciting bilious remittent or intermittent; that of New-Orleans or Vera Cruz, capable of generating yellow fever in a fit subject; that of the fever hospital of London or Dublin, of generating typhus; that of Palermo or Breslau, of generating cholera. These, then, are "infected atmospheres." Let us, with this contaminated air, fill a ship's hold and cabin, and bring her into the port of Baltimore, Philadelphia, New-York or Charleston. What is likely to happen in each of these cases? Let experience answer. Any number of persons exposed to the rice field atmosphere, especially if in the state of sleep, will be attacked with intermittent or remittent; the typhus atmosphere will scarcely produce any effect, unless applied for a considerable length of time, and in a deteriorated constitution, depressed either by low living or by residence in an uncleanly, vitiated chamber; the yellow fever atmosphere will not affect a Southerner, no matter how his bodily strength may be disordered or impaired, but will attack a Northern man in the most robust and vigorous health. The cholera atmosphere will assail almost any one who enters it, but is favored by the same conditions which predispose to typhus.

Again, setting aside all reference to contagion, the poison which infects each of these atmospheres, possesses a separate tendency to adhere to fomites, or to spread itself through surrounding air. This latter property of self-repulsion, so common among ærial or gaseous matters, seems scarcely to belong to malaria; nor is it at all tenacious. If any one enters the rice field air then, supposing him to escape the effects of the poison, he brings away none, and may be approached safely. Thus is its influence limited within narrow bounds. But if a vigorous and robust individual undergo, without injury, exposure to a typhus air, he may on issuing forth, carry with him, such is its tenacity, in adhesion with his clothes, and forming a sort of personal

atmosphere, quite a sufficient quantity to affect any one who may approach him in a condition more favorable for the development of the disease. Instances of this sort have often occurred; thus at the famous Black Assizes at Oxford, in 1577, and in Exeter, and in Taunton, and at the Old Bailey, in London, the prisoners brought into court for trial, communicated to the court and spectators the infection from their jail, of a virulent typhus.

As to the tenacity of the ærial cause of yellow fever and of cholera, I do not think it remarkable, yet there are some facts which seem to show that it may adhere to fomites. The quality of self-repulsion, which I have said does not probably belong to malaria at all, is certainly very feeble in the poison of typhus. Haygarth, and others, would limit it to a very few feet, yet as in the instance of small pox, it seems sometimes to assume wings, and spread with fearful promptness. With respect to yellow fever, the question is hotly disputed; but we must believe its capacity for extension, in other words, its self-repulsive power to be considerable, unless we are willing to pronounce it a disease of very wide and varied origin. It has either arisen or been imported into Philadelphia, New-York, New-Haven, Boston, Cadiz, Seville, Gibraltar and Xeres, and soon after being noticed at, or in the neighborhood of some infected vessel, or other centre, has pervaded those cities very rapidly. Still more forcible must be the self-repulsion of the cause of cholera, which from its several centres, rolls on every side its waves of pestilence so diffusively—and as at Gates-Head, near Sunderland, with such incredible intensity and suddenness.

Suppose lastly, then, that the several holds and cabins of the infected ships, above described, were broken open in the midst of the harbor of a populous city, and not entered by a single individual. The malaria of the rice field would continue harmless in its place of deposit; so, probably, would the malaria of the typhus hospital; it is not so clear that the malaria of yellow fever would remain innocuous; nay, if season and temperature favored, it is highly probable that cases of yellow fever would be developed; but I do not entertain a doubt that the atmosphere of cholera would immediately diffuse itself, and excite this terrible and devouring pestilence.

Here, then, I conclude this imperfect and hasty discussion of some of the most obscure topics of professional investigation, fully conscious of the defects of my essay, yet earnestly hoping, that if I have not succeeded in greatly elucidating my subjects, I have at least, excited in your minds an anxious zeal to learn all that is known concerning them, and a determination to press your inquiries still farther, and to become discoverers in your turn, of useful and unknown truth.

While we take a present and retrospective view of the terrible and mysterious inflictions which, under the title of epidemics, have from time to time, desolated our race, we shrink within ourselves, and humbly confess the feebleness of human strength, and the narrow boundaries of human knowledge. Such humility is, however, the surest basis of true science; and that experience of the past, which is the most faithful prophet of the future, consoles us with the confident hope, that the bountiful Benefactor who has denied nothing truly useful to well directed labor; who has given us to ascertain the principles of motion of the immense worlds and systems that surround us, and has even taught us to avert His own lightnings and His hail; will, in time, inspire us with skill also, to arrest and control "the pestilence which walketh in darkness and destroyeth at noon-day."

CHAPTER VII.

SEATS OF DISEASES.

THE animal body consists of matter in its two common forms, solid and fluid, the latter constituting, doubtless, much the greater part of the mass. An exsiccated carcase or dried mummy is strangely light. The ratio has been estimated variously; by some as high as 9 to 1, but this may be pronounced an exaggeration.

Modern physiologists since Bichat, speak of the solids as divided into several tissues. These are distinguished from each other by chemical composition, as well as by anatomical structure,

or arrangement of minute atoms. Thus, there are the mucous, serous, nervous tissues; the hair, the bones, the teeth, the fat, the glandular parenchyma—each of these obviously containing some substance or modification of living material absolutely essential to itself, its peculiar mode of life, its exclusive function. It is mere trifling, to dwell, in this relation, upon the minute discoveries of chemistry as to the elementary bases of these materials or substances, which would seem to be very limited in number, and, indeed, almost common to the animal, vegetable and mineral world.

The fluids also vary very much in composition, yet present the same definite exclusiveness, however nearly they may resemble each other. The blood,—the chyle from which it is formed—the lymph, which seems its most highly vitalized portion—the gastric fluid, so necessary to digestion and solution of food—the seminal secretion, which contains the germ of future being; these, and numerous others, of which it is not proper here to speak in detail, are all peculiar and distinct.

That each of these solids and fluids may be impressed by the influences of disease, and may assume a morbid condition, no one has denied or can doubt; but it has been made a question so often discussed, and deemed, whether correctly or not, of so much importance, that we must not altogether omit the consideration of it in this place.

Where, and in what part or parts of the organic structure, shall we seek the original seat or location of morbid action? Is the source of subsequent evil to be looked for in alteration of the properties of the solids, or in vitiation of the fluids? The exclusive devotion to one or other of these alternatives, has separated the speculative philosophers of medical science into two schools, which have wrangled from the earliest times without concluding their interminable discussions of solidism and humoralism to the present day.

Disease, when fully developed, is often complex, and extends itself over many tissues, and modifies many of the fluids;—can we hope, by careful analysis, to resolve it into its constituent element and detect its primary and earliest point of invasion, its first and incipient changes? This must be attempted, with whatever hope or prospect of success. Indeed, it is only by the

attainment of this minute knowledge, and the definite acquisition of clearly ascertained facts and fixed principles on this subject, that we shall succeed in conferring upon the profession of medicine a truly scientific character, and elevating to its due position among the higher branches of human knowledge the divine art of healing.

After ruling long in the schools throughout the earlier and middle ages, the chemical physicians sunk into disrepute, and thus it became, in more modern times, the fashion, to sneer at the somewhat antique doctrines of what was called "the humoral pathology;" and the generation to which I belong, and which may be said to be rapidly passing away, was taught to regard it and to speak of it, if it were mentioned at all, in the most scornful terms, as full of obsolete absurdities. Broussais following Brown, Cullen, Hoffman, Parry, and indeed almost all their distinguished cotemporaries in Europe; and in our own country, Rush and Chapman, from whom the general tone of medical opinion has been derived, fully agreed in regarding the solids of the body as the true seats of diseased action; some of them, indeed, going so far as to deny the possibility of any marked or notable change in the constitution of the living fluids, and all holding such changes, if deemed possible, to be merely the ultimate results of morbid action in the tissues.

Within a very few years, the current has set in the opposite direction, and we are in danger of being swept away by the vehemence with which the new school of chemical pathologists press upon us the ascertained changes in elementary composition, proved to occur early and uniformly in both fluids and solids under the agency of known and observed causes of disease. Since the publication of Bostock's useful work, our physiological theories have become more and more modified by chemical views, and Liebig, of late, with his coadjutors, has made a rapid and wild inroad within the domains of pathology, including both hygiene and therapeutics. It is well known to you, and will be seen on reference to the several editions of my syllabus, that I have held, in relation to these topics, my usual eclectic position, and carefully avoided both extremes.

While I was forced to refuse my assent to the ancient hypotheses, which, guessing darkly, but shrewdly, at truths now well

matured, attributed diseases generally to alterations in the blood and other fluids, some of which were, by the very terms used, clearly incompatible with the continuance of the living condition, fermentation, putrefaction, contaminations incidental and specific, various acrimonies, acid, alkaline and peculiar; I could not, on the other hand, venture to deny to these fluids, composing the larger part of the animal mass, their due and, indeed, inevitable participation in the effects of such agents as give rise to disease. I believed, with Bichat, that "humoral medicine has been much exaggerated; but it has solid foundations, and in a number of cases, we cannot deny that all should be referred to a vice of the humors."

The exclusive solidists have contended, that we shall find all morbid action to belong to the tissues, which are excited or irritated or otherwise disturbed in their movements; such disturbance remaining limited and local at sometimes, and at others being extended and becoming general by means of sympathy or nervous communication.

Dr. Parry, in his very able and ingenious treatise on pathology, does not hesitate to refer all diseases to the deranged states of action of the vascular—the circulating system alone; principally, to mere alterations in the momentum of the circulating fluid, either generally or locally, these latter constituting "determinations" to particular organs. Hence, we may also infer alterations in quantity—the anæmia and hyperæmia of recent writers. To these, in their several combinations, he attributes all the varying and infinitely numerous results—the signs, symptoms, phenomena and effects of disease.

Brown, and Broussais, borrowing freely from him without acknowledgment, attempted a simplification of pathology, by maintaining disease to be, in all cases, nothing more than a *super* or *sub* condition—a plus or minus state of the vitality of the part which it affected; a mere diminution, on the one hand, or enhancement on the other, of the intensity of the specific action of such part.

Not to dwell upon any of the objections to this view of the case, it may be remarked here, in passing, that the simplification thus proposed by these ultra solidists, is far more apparent than real; for, as is obvious, the functions of many a tissue are varied,

the specific action, therefore, must be proportionably complicated, and must depend upon several elements; and, hence, it follows, that its derangements may assume a complex character, some of its vital properties being enhanced or excited, while others are subdued, depressed and in abeyance. In gastritis, the mucous surface secretes no more solvent fluid, but throws out serum, and is highly sensible and irritable.

When I first assumed the duties of this chair, it was incumbent on me to combat the popular views to which I now allude, with some vehemence and pertinacity, and in the struggle I stood for a short period almost alone among the American medical colleges; but at present, you will almost smile at hearing the modest defence which I felt myself compelled to offer for a modified humoralism; such as I now indeed profess, but which has now been left far behind by the progress of the chemico-pathological doctrines.

I maintained that the explanation of the origin and extension of disease given us by the exclusive solidists, though correct doubtless in a great many instances, and plausible in others, did not seem to be universally applicable or satisfactory. Irritation, spasm, laxity and tension, might account for much that we saw; but did not and could not give rise to all the phenomena. The vitality of the blood had come, since Hunter's time, to be an established point in physiology. None of the above phrases would apply to morbid conditions of the blood; but as disease was on all hands confessed to consist in the misdirected action of vitality, or of the vital powers under the influence of certain causes, it remained to be shewn why similar morbid results should not follow from the application of similar morbid agents, to the living fluid as well as to the living solids of the animal body. The blood is formed from and out of chyle—the elaborated product of digestion. In its properties, qualities and intimate constitution, it must, beyond all reasonable question, correspond closely with this its original source. Marcet and others tell us distinctly, that chyle varies somewhat, as we should expect, in chemical composition, according to the kind of food from which it has been obtained. The stomach must indeed be omnipotent, if it could procure the same identical results from a diet of salted

fish, rancid oil, acrid vegetables and impure waters, as from fresh meats, fruits newly ripe, and the sparkling fountain.

The blood exhibits clearly many changes in its condition and composition; by its refusal, under certain circumstances, to undergo, in the ordinary way, the spontaneous process of coagulation, and by various peculiarities shewn during and after coagulation, such as the buffy coat so commonly met with in inflammation. It is dark and thick in some cholera cases; in scurvy and purpura it is attenuated, and, as the phrase is, dissolved.

We infer from ultimate series of phenomena, numerous changes in the blood, which are not visible. We cannot detect in it the contagious matter of small pox or scarlatina, yet we believe it to exist there in a form which we have no means of developing or making sensible. Inoculation with the blood of measles and scarlatina, has conveyed these diseases; the small pox affects the fœtus in utero from the mother; and Coleman, professor in the Veterinary college, announces that he has propagated farcy, (which, with Sauvages, he recognizes as a form of scrofula,) by transfusion of blood from a diseased to a sound horse, and even by transfusion from a diseased horse to a sound ass.

Similar changes take place in the chemical state or composition of the solids of the body, from disease. All the tribes of men, turn with dread and disgust from the flesh, as well as from the secretions of a sick animal; and we have on record many instances of fatal disorders following a meal of such flesh; nay, even the obscene birds of prey, the vulture and the raven, as well as the dog and the wolf, die, poisoned by such carrion, though fattening ordinarily upon carcasses of natural and undiseased putridity.

You must not imagine that facts like these could be altogether overlooked, even during the most rigid despotism of the solidist pathology. In the attentive perusal of almost every writer of authority, within a century, you will find some allusion made, to a greater or less degree of contamination of the fluids, although, with scarcely an exception, all these authors would shrink from any acknowledgment of a definite belief in the obsolete and condemned theories of humoralism. You will meet with several

such hints in the productions of the learned Good. I have already quoted from the illustrious Bichat, a forcible expression to this purport. Armstrong talks much of the blackness of the blood in typhus, its cause and its effect; and Wilson Philip acknowledges, in his treatise on indigestion, that there must ensue in this malady, when protracted, vitiation of the chyle, the circulating mass, and the fluids supplied by it to the secreting surfaces.

Of late, the language of pathology has undergone a remarkable change. Gregory advocated, in 1829, the then strange doctrine, that buffy blood, the nature of whose peculiarities he contends is unknown, is itself "*per se*," the cause of many severe disorders, opthalmia among them. Now, we find many disputants ready to ascribe to a morbid state of the plasma (which may or may not be the source of the buffiness of the blood,) most if not all the early phenomena of inflammation. Stevens teaches that yellow fever depends upon, and is occasioned by, certain morbid changes in the blood—essential, primary, notable, and definable; and Chomel, writing in the very focus of solidism, seems inclined to extend a similar doctrine to all fevers of every class.

Until very recently, (the first definite details on this subject, given in the clear methods of modern inquiry, being derived, perhaps, from the experiments of Lawrence and Coates, in our own country,) it was customary with the solidists to deny boldly, the possibility of the entrance into the circulation of any article whatever, in its own unaltered form and in possession of its characteristic properties, and to assert the necessarily fatal effect of the mixture or intrusion of any extraneous substances unassimilated in the mass of blood. But chemistry, more careful, minute and successful than formerly, in its organic investigations, has made us familiar with the detection of heterogeneous matters in the living fluids. Home, Hale, Milnor, Magendie, and a host of others, have demonstrated the introduction of medicinal substances directly, by injection into the veins, to be not only compatible with life, but efficient in the production of calculable and sometimes useful results; and Liebig, almost always ultra in his opinions, maintains that their absorption and incorporation with both the fluids and solids of the animal body,

is the general law, proposing as an instance, his belief that during narcotization by opium, atoms of this substance are intimately mingled with, and indeed, form constituent portions of the particles of cerebral matter, which by their aggregation build up the brain.

The long catalogues of nosologists will inform you of the specific modes of morbid action, which find their place in the several tissues and organs, and derive their names from these localities. The phenomena of disease must vary with the diversities of the structures and the composition of the parts which it affects, and its results must depend upon, or at least, be modified by these contingencies. Each tissue is in a greater or less degree compound and complicated, consisting always of various forms or species of material. But into the composition of every part, whatever may be its special peculiarities, must enter nerve and blood-vessel, conveying nervous matter and blood. These, then, must be essential constituents of every the most minute portion of the living organism, and we know of nothing else thus uniform and essential. To these we infer, then, that every living part is indebted, and upon these dependent for its vitality. If the connection of any part of a living body with the spinal marrow and brain be intercepted by cutting or tying the nerve which goes to supply it with that influence whose importance is so well known, but whose nature so obscure, it ceases to feel and to act, and thus yields up its vital condition; the same effects, precisely, follow when impediment is presented to the circulation of blood through it, by tying or dividing its artery. It is not too much to say, then, that these systems, the sensorial namely, and the vascular, are, so far as we know, the exclusive seats of the principle of life. I would not, of course, deny a participation in the living condition and in its phenomena, to the other tissues and systems, but I would unhesitatingly maintain, that for this participation they are directly and absolutely dependent upon their nerve and blood. These again, are reciprocally dependent upon each other. A supply of red blood is indispensably necessary to sensation and volition; and the blood promptly loses its vivifying powers, when the sensorial functions are interfered with.

But, if we are justified in thus contending, that the vascular

and sensorial systems are the original and exclusive seats of self inherent vitality, and if it be in and through these only, and by virtue of their proper influences that the vital actions go on, the inference is clear and obvious, that they must also be the exclusive seats of disease in the primary sense, and in its incipient movements; for disease, in all its varieties, is acknowledged to consist merely in modifications of original and natural action. Whether these modifications differ in degree simply, or in kind and nature also, is a question which must be discussed hereafter.

The derangements of these two systems, are often readily separable. A blow upon the pit of the stomach is immediately fatal, by the vehement, but indescribable, disturbance of the nervous system. Syncope, from mental emotion, may cause sudden death; and so, indeed, may sensorial agitation from any passion in intensity, giving rise to convulsion, spasm, palpitation, asphyxia; these occasion no change of composition, construction or arrangement of parts. They are, in the strictest sense of the term, functional, and leave no trace of any organic alteration whatever.

Diseases of the vascular system, on the other hand, always present cognizable changes in the constitution of the fluids or the structure of the solids. Such changes may be minute, but it is now believed will always be detected on careful examination or analysis. Under this head, we include inflammations of every variety, the Protean class of fevers, hemorrhages, and the profluviae.

Be it remarked, further, that these sensorial and vascular derangements, tend almost inevitably, by their continuance, to produce each other, and thus often occur intermingled together. The most purely functional disorder of any part, on account of the close connection of its vessels and its nerves, must tend, if protracted, to disturb its local circulation, and thus give rise to alteration of structure or disorganization. Light, too intense or long continued in its application to the eye, will produce ophthalmia. Palpitation of the heart, too often renewed by mental emotion, will give rise to angina pectoris, with softening or osseous or earthy deposit, or to aneurism of the organ. Sir B. Brodie having, for experiment sake, passed a thread through the par vagum of a rabbit, (like a seton,) found all the parts supplied

by that nerve, shortly after, in a state of high inflammation. On the other hand, all changes of structure, whether by inflammation or otherwise, and all vitiations of the circulating fluid, will occasion diseased sensations, and prevent the performance of the specific offices of all the organs of sense. Nay, some of them give rise to the most violent and extensive nervous disturbances—tetanic, convulsive, and maniacal.

The knowledge of the seat and nature of any disease, which, of course, implies the ability to distinguish it from every other, is technically termed **DIAGNOSIS**. A few words may be said here upon the general subject; the discussion, in detail, of particular characteristic symptoms, such as belong to, and indicate, the presence of each separate malady, must, of course, be deferred to be dwelt on in its proper place.

In a vast majority of instances, careful observation will afford us abundant light as to the situation of a disturbed organ. Pain is the most universal symptom of disease, and the most elementary knowledge of anatomy will fix our attention upon the correct point. Physiology offers us her valuable aid; and, by an enquiry into the condition of the functions, ascertains for us the state of the organs engaged in their performance. A more elaborate investigation must be made into the sympathetic relations which connect and control the whole organism. We must guide ourselves here, by a careful employment of the records of experience. From a prudent resort to these authorities, we learn many things as facts—ultimate facts in the present state of our science, which we cannot explain or account for. Thus, for example, we do not understand why the pulse, at the wrist, should be small and contracted, when the mucous membrane of the stomach and intestine is inflamed, but full and bounding when the serous tunic, which lines the thorax, is similarly affected; yet, this difference between the pulses of gastritis and pleurisy, has been known from time immemorial. We do not understand why the rupture of a blood-vessel in the chest should be attended by a quick, frequent pulse, and the same accident within the skull, by a slow, full one; nor why the pulse should intermit so remarkably in certain cases of hydrothorax or hepatitis, and, in other cases of the same affection, should not present the occurrence of this phenomenon.

It is in regard to these innumerable sympathies, direct and indirect, which, by the obscurity—the apparent uncertainty, and, perhaps, the occasional irregularity of their influences, tend to increase so much, in certain instances, the difficulty and intricacy of our diagnostic investigations, that we are led to appreciate the actual value to the physician, of experience, tradition, and observation. The importance of these modes of illumination is apt, I fear, to be underrated by the scientific student of the present day, in his too sanguine expectation of clear results from the seemingly far more definite methods of analysis—the knife, the retort, the microscope; yet, it is hardly an exaggeration, to say of them, that they form the true bases of our science.

It has been remarked, that the sympathies excited by the affection of different tissues differ much. But, all our organs are composed of various tissues, which may or may not be deranged together. We do not expect from an inflammation of the parenchyma of the liver, the same general symptoms which are connected with that of its peritoneal covering; nor shall we see “animal life as much hurt” (to use a phrase of John Hunter) by the inflammation of the external serous tunic of the stomach, as by that of its internal mucous coat, although, perhaps, the former may be quite as grave and dangerous as the latter.

Now it is plain, that all the parts of which an organ is made up, may be simultaneously diseased, and when this happens, we may find it difficult to unravel the complex and apparently confused symptoms sympathetically developed, unless we apprehend the cause of this confusion.

Again, I must not omit to impress upon you the fact, that we are sometimes liable to be led away from the actual seat of disease to other, and it may be distant points. Head-ache may arise solely from the presence of crude *ingesta* or other improper contents in the stomach: Vomiting, as in sea-sickness and after a fall or concussion, exclusively from some disturbance of the brain: Convulsions from the mere presence of worms in the intestines; and I might increase this sort of catalogue indefinitely.

Amidst such embarrassments, we are accustomed to look to morbid or pathological anatomy—the examination of bodies dead of disease—for assistance and illumination. Yet while I acknowledge the reasonableness and hopefulness of this resort, I must

warn you not to form overated expectations of advantage from it, decisive and clear as it may seem in its offered results. Of the causes of disease, we can, it is obvious, learn little or nothing by this mode of enquiry, except in a few instances, such as the melanosis of the collier, and the phthisis of the dry-grinder.

Even of the effects of disease, we must not expect to derive clear or trustworthy information by the mere inspection of the dead body. It is exceedingly difficult, if not absolutely impossible, to distinguish between essential and incidental lesions; between morbid appearances resulting from the fatal malady, and changes impressed by agents used as remedies.

The records of pathological anatomy, and those of medical jurisprudence, are full of instances of such confusion and uncertainty. Hunter tells us of actual corrosion of the stomach in healthy criminals, examined after execution. Yelloly and Beck describe the well known marks of gastric inflammation in similar instances. Serres gives us the history of certain apoplectics in whom on dissection, he found gangrene of the stomach and rectum, which he ascribes plausibly enough to the irritation caused by cathartics and enemata exhibited by their attendants during the attack. I have assisted at many examinations of cases altogether analogous, in which after like exhibitions of the same remedies, there were found no such appearances. What certain or conclusive details have we yet offered to us, by the morbid anatomist, with regard to fevers—subjects of more frequent and minute inspection than any other or all other causes put together. As I peruse the mass of documents now fearfully accumulating, I find in each class the most discrepant statements; now the head is affirmed to be the principal seat of organic injury; now the thoracic viscera; now the abdominal; now the vital fluid itself; and where the malady has proved most malignant in its intensity, most rapidly and early fatal, it is not unfrequently the fact that it has left no trace whatever.

We must not ask him to unfold to us the seat or mode of lesion in deaths from functional affections—spasmodic, irritative, asphyxious; as in poisoning with prussic acid, or a fatal blow on the pit of the stomach, violent mental emotion or a protracted swoon, or in breathing irrespirable gases and the like. Here the *vis vitæ* has been extinguished, the principle of life has suc-

cumbed directly under a force applied to some important portion of the sensorial system ; there is neither perceptible loss of substance, nor addition of intrusive deposit ; the relative position of the animal structure is not deranged or distressed ; the body, as for instance, in a drowned man, "has all the composition it ever had."

Nor can we hope from him any insight into the obscure enquiry concerning the primary seat—the point of invasion—the original locality of any disease. He is liable to be altogether misled by sympathies which extend morbid action from less to more important parts, and *vice versa* ; by the absolute transference of morbid action, as in metastases ; and by the complicated consequences which flow in successive series continuously from a single cause. It is very difficult, too, if not indeed impossible, to estimate correctly the degree of impediment presented to the proper performance of a function, by the removal of portions of original structure, or by the deposition of new matter—familiar occurrences both of them ; or to appreciate fairly the amount of injury or irritation dependent upon the nature of the modifications thus effected.

The true value of pathological anatomy lies in its connection with the whole previous history of the case or cases examined, and the scientific physician will make it of much avail. His attention, industry and capacity, will be taxed to the utmost, in the observation of the signs and symptoms, from the commencement to the termination of the case, with a full appreciation of all the contingencies that may have tended to modify its progress, or in any way make an impression on its character and history. With these, he will then proceed to collate and compare minutely and cautiously, the phenomena presented upon inspection. We cannot trust to memory in reference to these details, nor depend upon casual remarks transiently passed over ; it is absolutely essential, that we collect and preserve more defined statements by notes taken at the bed-side of the sick. I cannot, therefore, recommend to you too strongly, the practice of thus making exact memoranda of the cases under your care. The habit of setting down in writing your observations, and embodying your inferences and reflections in distinct words, if commenced early and steadily persevered in, will assuredly be productive of the highest advantage and improvement. Our confidence in the

“numerical method,” and in the results of statistical tables, may, indeed, be easily pushed too far ; but, it would be worse than idle, to deny their very great utility.

Marshall Hall has observed, that “the number of bodies which a physician has inspected, may be fairly taken as the just measure of his industry and desire for knowledge. True, it is painful to request of the friends in many cases to be permitted to examine the remains of the deceased ; it is painful to visit the house of mourning for this purpose ; the manual operation too is attended with disagreeable circumstances. Yet, it is his undoubted duty to press the matter with as much earnestness, or even urgency, as the nature of the case may admit, and it is incumbent on the friends to further an object so replete with general good.” I cannot help hoping, therefore, with Marshall Hall, that the time will yet come when the physician will not be regarded as having fully done his duty until this last sad office has been performed. And, so far as my own experience has gone, I may venture to assure you, that a request to the above purport will rarely be refused. Nay, it is not an uncommon circumstance, among the more intelligent of our clients, to be anticipated in the expression of a wish that such an examination should be made.

CHAPTER VIII.

TENDENCY OF DISEASE, ETC.

THE tendency of all the various forms of disease, is essentially, and in their own nature, to death ; death, either of a part or of the whole body, according as the morbid affection has been general or local. The announcement of this opinion may be startling to those among you who have received the ancient and plausible doctrine, of the existence within the constitution of a restorative power, from time immemorial, denominated the *vis medicatrix naturæ*, by whose agency the movements of disease are aroused and directed to the expulsion of some morbid cause,

or the renovation of some injured portion of structure. It is curious to trace this supposition of a *vis medicatrix naturæ* throughout the varied series of events which originated and which still serve to confirm the belief in its influence.

A blood-vessel is wounded or ruptured ; after some hemorrhage, more or less, the subject faints either from mental emotion or from the actual want of a sufficient quantity of the vital fluid to stimulate the heart and brain ; the circulation ceasing or languishing for a time, opportunity is given for the coagulation of the blood in and around the orifice which is thus plugged up, the recovery of the patient being, of course, ascribed to the *vis medicatrix naturæ*.

Indigestible or improper food being taken into the stomach, the organ is oppressed by its presence ; general relaxation follows with nausea ; vomiting and purging are excited, and the offending matter evacuated ; the relief being ascribed to the *vis medicatrix naturæ*.

During the ancient reign of the humoral pathology in its undefined, unlimited, and exaggerated form, all fevers, the exanthemata especially, were imagined to constitute mere efforts of nature for the expulsion of some morbid matter by eruption or transudation. The practice deduced from such notions was equally sound and reasonable. The patient was sweated with blankets in a close room, often heated with artificial fires, while the powers of nature, suspected of being insufficient for the attainment of her purposes, were supported by the administration of stimulating cordials and alexipharmics. Nay, even in the writings of a Cullen and a Rush, and in some of the lucubrations of the present day, we find fevers and the phlegmasiæ attributed to this supposed recuperative re-action after debility ; as if any cause, in its own nature depressing or sedative, could carry with it an essential proclivity to an excitant operation, or, as if the human constitution were so disposed as to swing like a pendulum as far on one side of its correct centre as it had been previously drawn or pushed to the other.

The animal body is a combination of machinery so admirably constructed, that, like an ingenious piece of common mechanism, it has a tendency to continue the movement or mode of action

for which it was made, and which, when it began to live, it began to carry on. There are many circumstances, however, such as have been enumerated among the "causes of disease," which serve, when brought into contact with it, either to obstruct these regular and natural actions, or force it to fall into certain new and irregular movements—the multiplied forms of disease.

Happily for us, few of these causative agencies are permanent in their application or influence. The occasional excitement is removed or passes away, or the predisposition—the susceptibility to its effects, wears off or is exhausted ; the morbid impression, if not renewed, undergoes a gradual effacement by the ordinary processes of use, waste and supply, and is ultimately obliterated, the system returning to its original condition of health, or approaching it more or less closely.

But we do not always witness this restoration of the natural actions upon the removal of disturbing contingencies. Many functions, if suspended for a time, are not likely to be resumed, even though the organs engaged in their performance have escaped all lesion.

Asphyxia continuing for a brief period, no matter how produced, is fatal ; the heart refusing to resume its suspended systole and diastole. Respiration being checked for a time, whether by drowning or occlusion of the mouth and nostrils, or compression of the trachea, the subject will breathe no more. And here, I suggest to you the importance of considering this point always in your prognosis—the impediment to the performance of any function offers a risk proportioned to its protracted duration. Even a transient interruption to some of the more essential of the vital processes may be very promptly destructive by the peculiarity of the impressions sympathetically diffused. Thus, mere concussion of the brain sometimes by a blow or a fall, or as in some apoplexies and certain cases of strong mental emotion, a mere modification of its vascular condition without any perceptible lesion, shall determine immediate death. Thus, too, a blow upon the pit of the stomach kills instantly by an undefinable impression upon the great sympathetic under which the whole system at once succumbs without a struggle. Prussic acid applied to certain surfaces, as the eye and the tip of the tongue, produces an

extinction of life similarly quick—perhaps, by a similarly indescribable impression conveyed with lightning speed throughout the entire organism.

In disorders of structure, every thing must depend upon the nature of the functions interfered with, whether immediately necessary to the preservation of life or not; whether the part is irritable or indolent; whether comparatively insulated or closely bound up with other organs by intimate and extended nervous relations. If, for example, the thyroid gland becomes affected with bronchocele, little or no injury accrues to the general health, unless the goitre grow to so large a size as to interfere mechanically with respiration or deglutition, or with the cerebral circulation.

But when the heart is the seat of organic derangement, the whole body must suffer on account of the universal dependence of every part upon a uniform and regulated circulation; while its indispensable, but now ungoverned action, becomes self-irritating and self-exhausting. Thus is it also with the stomach and intestines, kidney and bladder, whose duties admit no interval—whose sympathies know no repose.

Morbid agents, the causes of disease, differ among themselves, not only by the tenacity or permanence of their impression, but by its specific or characteristic peculiarity in the production of given results. Scrofula is equally tenacious with carcinoma; but most of the structural alterations it gives rise to, are compatible with the continuance of life; that is, they are only fatal by degree. Not so with cancer, which effects such alteration of the condition of the part it occupies, as must essentially destroy the body to which it belongs. Hence we term it and the analogous affections, fungus hæmatodes, etc., malignant; and the appellation is deserved.

Under ordinary circumstances, a part takes on again its usual and healthy action, when the causes which disordered it are timely removed, with a readiness proportioned generally to its vascularity, because this is almost an exact measure of the force and fulness of its vitality, and of the rapidity with which it goes through the physiological alternations of waste and supply, or renovation; to which, and not to any new or separate princi-

ple—a distinct *vis medicatrix*—I ascribe unhesitatingly all processes of cure or restoration.

Disease is by no means a natural condition of the animal body, nor is it the product of any spontaneous action of any organ or system of parts, or of any one of the vital forces, so called ; neither can any separate natural provision be shown to be made for its removal or arrest, and most surely not, as has been imagined, by the very processes in which it consists. It is “a forced state,” as Brown and Rush have pronounced life itself to be ; not only occasioned by, but dependent upon, the presence or influence of some special agent, interfering in its own definite mode, with the regular play of the organization by which the functions are performed. This cause ceasing to act, the disease produced by it necessarily comes to an end, and the train of natural and healthy movements goes on again ; but if the influence of the cause continues permanent, the disease will continue. Hence must ensue disorganization or death, in the part affected, if the disorder be merely local ; if general, systemic, universal or what Symonds calls “somatic” death, must be the consequence.

Of euthanasia—death without disease, from natural decay, I have already observed that it is but the unavoidable result of the gradual impairment and extinction of the functions, occasioned by the progressive failure of action of the organs of supply. It may be referred to in this place, in the phrase of Blumenbach, as “the last and principal object of medical science to procure.” The shortness of human life has been the subject of incessant lamentation and repining, yet without just cause ; for if ultimate decay be a necessary consequence of the construction of the body and the constitution of its materials, death surely is to be considered rather as a relief from the evils of extreme old age. Indeed, when we look upon the dim eye, the tottering step and the childish imbecility, both mental and physical, of the old man, it is a melancholy consolation to reflect that the outlets from life are so numerous, that we are likely to reach our certain goal, the grave, by some nearer and less lingering route, and thus escape the hopeless and helpless state of dwelling dotage.

Bichat describes death from old age as commencing with a loss of the power of locomotion ; the circulation becomes feeble,

the extremities no longer retain their vital warmth ; the organs of the senses lose their faculties ; respiration, slow and oppressed, grows more and more difficult ; and finally terminates for ever with a deep expiration.

Death from disease—Pathological death will of course present phenomena varying relatively to the causes which produce it. The topic is a vast one, and full of interesting detail ; but I must abstain here from any minute discussion of it. It may be well, however, to remark that some of these causes operate apparently by merely impeding the proper play of the organs, which cease to act, gradually becoming more and more weakened, and finally exhausted in the struggle. Fevers are usually fatal in this mode ; by their congestions, preventing the performance of some necessary function ; or by their inflammatory changes, unfitting the tissues for their duties. Lightning, on the other hand, prussic acid and some of the contagions, seem to kill by positive extinction of the principle of vitality. Observe the difference in an animal pithed, as the phrase is, in whom the powers of life succumb instantly ; and one decapitated, which continues to exhibit some of the phenomena of life for a period of indefinite extent. Notice a game cock, gaffed in the occiput, which dies instantly, or in the spine near the head ; and a fowl killed in the ordinary way, by cutting or twisting off the head, the bill opening and shutting, and the body leaping about for some minutes. In guillotined persons, “it has been unhappily proved, by numerous and sad examples, that sensibility survives decapitation—and the revolutionary executioner of Paris, Sanson, whose authority on this subject is of unequalled weight, often asserted that the head of Gardien bit the head of a fellow Girondin, received into the same sac, so freely and with so much force, that they could not be separated.” Drs. Seguret and Sue, after many experiments, maintained that the pangs of death last more than twenty minutes after execution in this mode. Two heads being exposed to the sun’s rays, the eyelids which had remained open, were briskly closed, and a painful contraction passed over the face. The head of an assassin named Terrier, subjected to these horrible trials, continued more than a quarter of an hour after decollation, to turn its eyes to the side whence any one called to him. Charlotte Corday, being cuffed by a low deputy of Sanson

on the cheek, while the head was held up, it exhibited its sensibility to the insult by flushing, tears and every expression of mortification possible to the living features.

Besides this obvious distinction of deaths into what I would, for want of better phraseology, speak of as its positive and negative forms, writers have suggested numerous divisions, founded on the nature of the circumstances. Dr. J. H. Symonds, the author of the able article on this subject, in the *Cyclopedia of Anatomy and Physiology*, recognizes two modes of death—1, molecular; and 2, systemic or somatic. The first refers to the abolition of the vital actions—nutrition and contraction, which go on between the particles of which living bodies are composed; the second—of those which take place between the organs whose combination constitutes the entire system, respiration, circulation, innervation, etc. He proceeds to lay down and illustrate the following propositions: 1. That molecular death does not, unless universal, necessarily involve systemic death; 2. That when partial, as in mortification, the tendency of molecular to produce systemic death, depends on the importance of the part; 3. That when occurring in one part, it can only induce the same change in another part, by interfering with some of the systemic functions; 4. That systemic death must necessarily be followed by molecular death; and 5. That its reality can only be proved by the results pertaining to molecular death.

Williams, in his valuable treatise on the principles of pathology, speaks of the chief varieties of the modes of death as follows:—

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| “Death (cessation of function) beginning at the heart— | } Sudden, Syncope,
Gradual, Asthenia. |
| Death beginning at the breathing apparatus— | |
| | } Asphyxia or Apnæa. |
| Death beginning at the brain—Coma. | |
| Death beginning at the medulla—Paralysis. | |
| Death beginning in the blood—Necrœmia.” | |

In those who are conscious of its approach, death is very generally (though not always,) preceded by a feeling of intolerable prostration and weakness, which some in describing it to me while dying, have referred to the heart or precordia, others distinctly to the stomach, the epigastrium. Respiration becomes

laborious, owing to want of energy in the nervous system, now deficiently stimulated by the feeble flow of blood from the heart, which acts more and more languidly; the blood is less arterial and vivifying, or rather becomes sedative by its augmenting venous quality; the sensorial influences are no longer transmitted from the brain and medulla spinalis—a full and heavy expiration is made, and the breathing ceases. The heart, of which the right ventricle “ultimum moriens” contracts last, dependent as you are aware, upon respiration for the power of continuing its actions, at length beats no more, and life is extinguished.

Yet these phenomena do not constitute death, although invariably attendant on it; for they are all to be observed in certain cases of suspended animation, when the subject is still capable of being resuscitated. For this reason, as I considered excitability to be the chief characteristic of life, if indeed it is not the very principle of vitality itself, under another name, so I would describe death to consist in the loss of the capacity of being excited by the application of stimuli.

The signs of death are, then, all of them, in some degree equivocal, though in the vast majority of instances the coincidence of the greater number of them would leave no reasonable doubt in the mind of the inquirer. The peculiar paleness and ghastliness of the face, and of the surface generally—the flaccidity of the cornea of the eye, and the icy coldness of the skin even of the trunk, would appear to be sufficiently distinctive; yet they are affirmed to have been occasionally concurrent in instances of merely suspended animation. Rigidity, which Louis and Symonds affirm to be independent of the cooling of the cadaver, is regarded by the majority of writers as a certain token of death. But Bichat doubts it, and I confess myself unwilling to trust to it. Before proceeding to interment, I would always wait for the commencement of decomposition, as evinced by its own peculiar odour. This is the only certain sign of death; and the thought of burying alive a human being, is too horrible to allow us to run the least risk of such an accident. And there are, unfortunately, too many instances on record of this mistake, to permit us for a moment to regard the danger as imaginary. Pliny mentions a young man of rank, who seemingly deprived of life, was placed upon the funeral pile. The

heat of the flames revived him, but he perished before his friends could rescue him from them. The great anatomist Vesalius, had once the inexpressible misfortune to commence the dissection of a living body, apparently dead. Less unhappy was the fate of the Abbè Prevost, who fell apoplectic, but recovered his consciousness, too late alas! under the scalpel. Preparation having been made to embalm the body of Cardinal Somaglia, the operator had scarcely penetrated into the chest, when the heart was seen to beat. The unfortunate patient returning to his senses, had still sufficient strength to push away the knife of the surgeon, but the lung had been mortally wounded, and he died miserably.

From Bruhier we have a statement, very probably exaggerated, but with all allowances, truly appalling—of fifty-two cases of persons buried alive, four dissected prematurely, fifty-three who recovered after being coffined, and seventy-two falsely considered dead. The individual appointed by the French government to superintend the removal of bodies from one of the principal burying grounds of the capital, reported that he had found many of the skeletons in postures which demonstrated their having effected motion and partial turning after interment.

Would to Heaven that the good sense of mankind would lead the civilized and christian nations to resume the ancient classical practice of burning the bodies of the dead. There is surely something shocking in the very idea of inhumation. It is, I confess, revolting to my own mind in the highest degree, to remember that custom dooms me

“To lie in cold obstruction—and to rot!
This sensible, warm being to become
A kneaded clod!”

But there is a much better argument than that derived from mere feeling, against the mode now universally practised in disposing of the human corpse. Upon the funeral pile we reduce to a heap of innocent dust, that which in a few days will be changed into a mass of putrefaction, tainting the air and spreading around it, if not taken far away, horror and pestilence. What matters it that we are at present able to remove it to such a distance, and to hide it so completely that it affects our senses neither of sense nor smell; although we have not succeeded, if

we may believe the statements of several respectable writers, Walker and Chadwick among them, in obviating the deleterious influences of its putrefaction upon the living, who breathe the neighboring atmosphere affected by it. The mere concealment of the decaying remnants of mortality, will not always be in our power. The "city of the tombs" is already more crowded with inhabitants, than the busy streets of Constantinople; the catacombs of Paris, and the cemeteries of London, are filled to overflowing. Nay, certain facts stated recently, with regard to the burial grounds of two of the cities of this new world, would lead us to doubt whether similar evils were quite so distant from our apprehension, as might have been imagined, from the comparative sparseness of population in our immense extent of territory.

How much better, then, for the cold and clammy clay, and the noisome grave-yard, to substitute the polished vase, the marble urn—in which we may preserve deposited, the relics of "all that our souls held dear," and dwell upon the remembrance of our friends with emotions of tender melancholy, mingled with no gloomy ideas of recoiling disgust. Their ashes may thus become the inmates and the ornaments of our habitations; and their constant presence may serve to over-awe us from what, being evil, would have been frowned upon by them when living, and to encourage us to those good actions, which we feel, would have deserved and met with their approbation.

CHAPTER IX.

PARTICULAR PHENOMENA OF DISEASE.

THE presence of disease is manifested by certain phenomena which experience teaches us to associate with it. Such repeated coincidence impresses on our minds the relation of cause and effect, as existing between some obscure changes produced by disturbing agents within the animal economy, and these their

external signs or ultimate and obvious results. Not a few physicians, evading all discussion on this subject, have been disposed to consider disease as practically consisting in a mere collection of symptoms, and to regard as nugatory all attempts at a reference to a common or proximate cause, capable of accounting for, and explaining their occurrence. The question is, indeed, a most intricate and difficult one; but its investigation is absolutely essential to our progress in the knowledge of pathological principles, and the deduction therefrom of logical and correct rules of practice.

I shall therefore go into a brief detail of these phenomena as developed in the several systems or orders of parts whose functions are affected and whose condition is in any manner notably altered. I shall endeavor to assign the rationale of these symptoms where it is known, while I shall frankly acknowledge my inability to trace it in a vast mass of examples. But even in these latter instances, we shall derive some advantage from the description and enumeration of events and changes which from observation we know to be coincident, although we may be entirely ignorant of the link which binds them together. This coincidence or connection with each other aids us somewhat in the effort at a correct diagnosis, as the detection of the intimate nature and seat of morbid action guides us to the requisite application of remedies. Besides, we shall learn much of prognosis in this way. Experience clearly teaches the tendency to death or recovery, to be foreshown with certainty, by a specified concurrence of signs, in familiar cases of disease; and in many others, if not indeed in all, such a concurrence affords reasonable ground for a prediction of the fortunate or fatal issue. Nor is there any thing in the course of a professional life, which tends more to the advancement of a physician, or inspires more confidence in him, than a general correctness of prognosis.

I proceed to sketch these phenomena in succession, relatively to the physiological systems and functions most affected; and here we are struck with the paramount claim upon our attention of the digestive organs. The sympathies which intertwine the several parts of the body, exhibit their influences far more promptly, surely and obviously, upon these organs, than any others. Nay, that disease must be local, indeed, which does

not sooner or later, give rise to gastric distress and annoyance. It is true that the complexity of these sympathies and the obscurity of their influences, may occasionally embarrass, rather than enlighten us, but even in the most obscure of these cases, it is useful to us to observe and to know the uniformity or frequency of the coincidence. Thus, the black vomit is ejected from the stomach when the uterus is ruptured; and although we know not how it is brought about, we should be satisfied by this circumstance happening during an unfavorable and protracted labor, of the occurrence of that almost inevitably fatal event. We shall, therefore, note first, the morbid alterations which present themselves in the organs and tissues engaged in the process of digestion.

The disordered conditions of the Digestive system and function, are shown—1. by alterations in the appearance of those parts of the system which we can palpably examine; 2. by impediments to the usual performance of the function, manifested in any obvious way; 3. by uneasiness, pain, or discomfort, referable to any of the organs concerned in the function; and 4. by changes in the results of action of these organs, diseased secretions, etc.

1. The extremities of the digestive tube become altered in condition, in a manner assumed to be indicative of correlative change in the intermediate portions. Thus, when the stomach and bowels are disordered, we have the tongue furred or coated with a morbid mucous secretion. When they are irritated or inflamed, it is sore and fiery red and ulcerated. In fevers, it becomes dry and variously discolored on the sides and surface, or is swollen and sodden. The most minute of medical note-makers, Louis, whose patient industry is worthy of all praise and imitation, denies, it is true, that any such regular correspondence exists between the state of the tongue and mouth, and the internal surfaces, as is here assumed. But I cannot help thinking that he has laid too much stress upon exceptions, and would still adhere to the opinions founded upon a long experience. I do not doubt the value of a careful inspection of the tongue in many diseases, as enabling us to deduce a correct and probable prognosis.

I am pleased to find these views confirmed by the sagacious

and experienced Holland, who says, "Among the external indices of change within the body, the tongue is, perhaps, the most valuable. Scarcely can the pulse compare with it, in the extent, variety and accuracy of these indications, which are not limited to disorders of the membranes and secretions of the alimentary canal, or to the presence of fever in its various forms, but extend, also, to the various states of the nervous power, the sensibility, the voluntary powers, and even the more intellectual functions. The physician cannot better study any set of signs, than those afforded by the tongue, the palate and the fauces; the terminating portions of that inner surface, along which so many actions are carried on, both of health and disease. The observations of Dr. Beaumont, on the precise and uniform relation between the tongue and stomach, in the case of St. Martin, might justify this remark, were it needful to seek any other authority than that of daily experience."

The tongue is cold, in bad cases of cholera. It is dry, in fevers which tend to assume a typhoid character—such as present a paramount derangement of the sensorial system. When the gastric and intestinal secretions are defective, from inflammatory irritation, it assumes a fiery redness, and is pointed, and hard, and dry. When these secretions are abundant and vitiated, it is swollen and soft, and a nauseous and offensive mucus is effused in the mouth, disagreeable both to the smell and taste. When the mucous tissue or its glands have ulcerated, it becomes also aphthous and ulcerates. In purpura, and in the hemorrhagic state of fever, blood exudes from it, and its epithelium is dark and polished. In paralysis, it is detruded to one side, and trembles in the drunkard. Hepatic affections cause it to put on a yellowish fur, and to be affected with a bitter taste. The mere color of the surface, which becomes darker as danger increases, is a symptom of importance, to be noted in the fevers of our climate. When covered with a black sordes, which also gathers upon the teeth, and adheres to the lining of the whole mouth tenaciously, we infer the state of the patient to be truly critical. Such is the appearance of typhus fevers of the worst grades, and of those fevers which in our climate, by mere protraction, become endowed with much of the character of typhus. This sordes, though first seen on the teeth, gums and tongue, is said

also to be exuded upon the mucous surface of the bronchi and pulmonary cellular tissue, impeding of necessity, the results of the function of respiration, and preventing the proper changes of the blood, which is always black in typhus.

Ulcers of the throat and inflammation of the tonsil and surface of the fauces and pharynx, whether constituting properly an original disease, or merely the result of some general affection, will demand much of your future attention. The state of the diseased surface, and the aspect of the ulcers, will afford ground for very reasonable conjecture as to the danger or safety of the patient. All these facts are plausibly accounted for, on the principle of direct or continuous sympathy; in which identity and continuity of structure, and similarity of function connect the internal seats of morbid action, with the external extremities of the tissue affected, and give rise to similar disturbance from the application to any part of a whole so indissolubly united, of an agent capable of affecting a malignant impression.

By exploration of the abdomen, we are able to arrive at inferences essential to a correct intelligence of the case before us. We distinguish by resonance upon percussion, such enlargements as depend on air within—by fluctuation, such as consist of fluid contents—by pulsation, the vascular, as in aneurisms—and by the resistance and weight and position, schirrhous of the liver and spleen, and other physconix.

2. I have already mentioned the almost universal disturbance of the digestive function, in all conditions of disease, not only of the organs concerned in its performance, but of every other system or tissue.

Anorexia—defect of natural appetite, is the first degree of this gastric derangement. Next, we have a sense of oppression, nausea, and vomiting, which seems excited to rid the stomach of some load. We are not, however, always to infer the presence in that organ of any noxious matter, when it is oppressed and nauseated. This mistake has done much harm. The same sensations are produced under very various circumstances, not only by inflammation and irritation of the mucous coat of the viscus, itself, but also by various modes of determination to the brain, as in approaching apoplexy, in sea-sickness, and from the circular swing. Yet there are to be found physicians, who so-

licit by emetics, the discharge of a supposed annoyance, in all cases of nausea and retching. In fevers, we have such a state of the stomach, from both circumstances above alluded to—the irritation of the abdominal viscera, and disturbance of the cerebral and sensorial system.

Farther impediments to the performance of this function, (except in the instance of mere constipation from torpor,) are shown in connection with

3. Uneasiness of some kind, discomfort, pain in the organs concerned. Some pains of the stomach are unaccountable; those, for example, known in dyspepsia by the titles of gastralgia and gastrodynia, so little significant and inexpressive. Others arise from flatulent distention, others from inflammation, and from the pressure of neighboring parts enlarged or indurated. Abdominal pains arise from like causes; colic from flatulent distention of the bowels, with air refused a passage; tympanitic oppression from similar extrication of air, either in the bowel or within the peritoneal cavity. The liver, spleen and pancreas, are subject to suffer from painful distention of their vessels, as in engorgement and congestion, and, like the stomach and bowels, from inflammation and its results.

4. The morbid secretions ejected by vomiting, are of exceedingly diversified nature and appearance. Some of them seem to be capriciously produced, while others are characteristic of or regularly connected with some diseased condition or some ascertained lesion. Of the first sort, are the foul and porraceous matters thrown up in the first stages of fever, and in all cases of indigestion; bitter, acid, alkaline, oily and rancid; of strange hues, white, brown, green and blue. Of the characteristic, we may mention the black vomit, which has by so many been considered diagnostic of yellow fever. To this pestilence it does not, however, belong exclusively, although it occurs so constantly, in its fatal progress, that it may fairly be regarded as one among its regular symptoms. It may happen, as I shall hereafter recite to you, in our ordinary fevers of every type, and in many other maladies. It has been met with, in the easy vomitings of pregnant women, and comes on just before death generally, in rupture or laceration of the uterus. The albuminous fluid, the rice-water discharges of cholera, are almost peculiar

to that horrid pestilence ; at least, if they take place in any other cases, it is in much smaller quantity and in only occasional examples.

II. Of the Circulatory System. The sympathies which connect the heart with the other organs of the body, would seem, upon a cursory perusal of the writings of the illustrious physiologists who have set themselves to investigate this subject, to be not only obscure, but capricious in a remarkable degree. Thus, while every passing cloud of mental emotion will agitate this susceptible organ with violent tumults, (*"Quam facile mille res turbant !"* exclaims Celsus,) decapitation scarcely affects it, provided respiration be continued artificially ; and the whole spinal cord has been sliced away or gradually destroyed without notably disturbing it. Personal idiosyncrasies are in this regard strikingly contrasted, and the infinite variety of circumstances and modes in which the circulation is affected, scarcely admits of description or arrangement. It is on this account that Celsus declares the pulse to be *"res fallacissima,"* and many physicians since his time, have been unwilling to lay any stress upon it, as a general means of obtaining a knowledge of disease and its probable results. Let it be our endeavor to avoid running into either extreme upon this topic ; refusing to rely with a blind and exclusive dependance upon disordered pulses, as manifesting the morbid conditions of the body, we shall never omit to inquire into the state of the circulation, both locally and generally.

The cessation of the heart's action for a time, or the great diminution of force of action which we call syncope, is a symptom much more alarming for the most part than dangerous. It is the immediate effect of many of the passions and emotions of the mind, and is brought on by loss of blood, inanition from want of food and large discharges. In these latter instances, however, and when occurring in the protracted stages of wasting disease, as in dysentery and some fevers, it is a token of a very unfavorable state of things.

Palpitation—a convulsive, interrupted, vehement beating of the heart, occasions always great anxiety and uneasiness both to the patient and his friends. It is a capricious symptom, sometimes absent in the most serious cases, and again urgent and troublesome where the most careful exploration of the thorax during

life, and the most minute examination after death, have failed to detect any change of structure or lesion of any part. I have had under my attention some very severe cases, in which nothing was obvious but a certain degree of gastric derangement, and others that seemed to be founded on a mere morbid, nervous susceptibility. It should always lead us to conscientious examination of the thorax, the methods of exploring which, and especially the employment of the stethoscope, are to be fully discussed hereafter. By these means, we shall usually be able to detect such organic changes as may have taken place.

These are the transient irregularities which occur in the action of the central organ of the circulation, and they, probably, depend upon the influence of causes which disturb this organ alone.

We go on next to speak of the continued or protracted irregularities of the circulation, the *morbid pulses*, which I have maintained, are never to be overlooked, but always carefully collated with the other manifestations of disordered health. The normal circulation we presume to be carried on, not only by the obvious agency of the great central viscus, but, in some measure and mode, with the co-operation of the smaller order of vessels—the capillary system; although I agree with Parry in the denial of any active efficiency in this matter to the pulsating vessels, arteries of notable diameter. It is clear, then, that the regularity of the circulation will be affected by any change in the condition of these minute vessels or their states of action, whether produced directly or sympathetically, as well as by such changes in the heart.

In order to understand with any degree of precision, the complicated diversities of the morbid pulse, it is necessary to describe, in some detail, the healthy phenomena of circulation, and to consider such variations as may occur *consistently with health*, under the influence of known agents, that simply disturb the pulse without deranging the functions generally, or producing disease. The pulse of an adult beats usually about 70 to 75 strokes in a minute; from this assumed standard it varies, however, under a great diversity of circumstances.

It is modified by, 1. Age. The pulse of an infant, at birth, is about 140, declining pretty regularly as life advances, except

during the changes of puberty, at which period it is somewhat accelerated. In old age, it is often very slow, and sometimes intermits. Heberden tells of an old man in whom it was not often above 30.

2. Sex. The female pulse is rather more frequent than the male; the difference is not very great—perhaps from 5 to 10.

3. Stature. In very tall men, as a general rule, it is slower, and in very short men, more frequent than the average. Yet, in a well known dwarf, very little above three feet in height, I have found it not beyond 60 to 65.

4. Sleep. The pulse becomes like the breathing, more measured and slower in sleep, unless disturbed by dreams.

5. The passions and emotions of the mind increase promptly and remarkably the frequency of the pulse, usually adding somewhat to its force also. These effects are, so far as I have observed, common to all the passions and emotions, with this exception, that they may all of them capriciously act in an exactly opposite manner, and give rise to fainting. The physician must be on his guard, or he will be led into error on this subject. An interesting remark made during a desultory conversation; a sudden reminiscence aroused by some obscure association; will often cause the heart to throb and the pulse to vibrate in a surprising manner.

6. The conditions of life have a notable influence on the circulation—a fact readily explained by a reference to the refinements of education and habit, and the susceptibility induced thereon. The pulse of the savage is slower than that of the civilized man; that of the uneducated ploughman than that of the inspired poet.

7. Diurnal changes affect the pulse, and these changes seem to exhibit a periodical variation worth nothing. There is some difference in the statements made by observers. I have satisfied myself, that there is some acceleration for about an hour in the forenoon—say about 10 o'clock, and in the evening. These latter have been attributed to the superadded effect of the several stimuli which have been applied throughout the day—that of light on the eye, etc.; but I think it can be shown to be independent of all these.

S. Temperature. Heat accelerates, cold retards, the pulse. Their alternations increase its frequency. 9. Food and drink accelerate it in proportion to their stimulating qualities. 10. Muscular exertion produces, as you all familiarly know, a very great effect in increasing the frequency of the pulse, raising it to 150 or 160. We should recollect, too, that this effect is most remarkable in weak persons, and in states of exhaustion and prostration.

Hence, "the differential pulse," most pronounced, say Guy and Knox, in convalescents and those otherwise debilitated, and in the early part of the day.

11. Idiosyncrasies should always be enquired into. In some persons the pulse is habitually frequent; in others, habitually slow. The variations recorded of persons in health, range from 40 to 100. Lizari is quoted in the books, as telling a scarcely credible story of an individual in whom it was not more than 10. Dr. Heberden attended, he says, "two patients, who, in the best health, had always irregular pulses both in strength and interval, which constantly grew regular as they became ill, and gave a never failing sign of recovery in their once more returning to a state of irregularity." Gregory speaks of a man whose pulse in health was 50, rarely rising, when seriously ill, to 72; and, of another, whose pulse in health was 120, and irregular, but, in fever, became both slower and regular.

The pulse of health may be described as regular—that is, the rhythm of its motions is exact; the intervals between the strokes are equal in duration, and the beat or stroke occupies at each repetition the same space of time; it is vigorous, sufficiently forcible to give the idea of gentle distention of the vessel, and yet soft, resisting with a degree of elastic firmness, but yielding to moderate pressure; it is full, as though the artery were exactly adapted, in dimension, to the quantity of fluid contained in it, yet not forcibly dilated; a certain definite period is taken up in this dilatation of the artery, corresponding with the systole of the heart, whose contraction, though not slow, is gradual and gentle, without hurry and abruptness.

Of all the qualities of the pulse, that which is most likely to be modified by agents which affect it without previous disturbance of the health, is its frequency; but these modifications are

transient in duration, and we are always to regard with suspicion, a permanent and remarkable change in the frequency of the pulse.

Let us now, taking the healthy pulse as a standard, proceed to distinguish, by comparison, the morbid pulses. These have undergone an infinite number of divisions and classifications. Galen made more than one hundred species. The Spanish physicians even added to this catalogue. The Chinese have three thousand, says Hosack. Our own Rush is by no means free from the imputation of making distinctions here without differences, and has sullied the simplicity and clearness with which he (otherwise) treats of this topic, with some of this affectation of minuteness.

The author, however, who has carried this affectation farthest, is Bordeu. After describing a multiplicity of organic pulses, he divides them into superior and inferior pulses, believing not only that the affection of any particular organ will occasion a peculiar and corresponding variation in the pulse, but that the diseases of parts situated above the diaphragm, and of those below it, originate different impressions on the circulatory system.

The comparative qualities of which, we shall find the pulse possessed in disease, are the following:—It is strong or weak; it is frequent or infrequent,—(frequency refers to the number of pulsations, quickness to the time occupied in the systole); it is quick, (jerking, abrupt) or slow; it is full (voluminous) or small (contracted); it is hard or soft; it is irregular; it intermits.

Slowness of pulse implies a deliberate systole of the heart—torpor or sluggishness, not weakness. Hardness implies, 1. That the tonicity and elasticity of the artery are unimpaired, and, 2. That the heart acts forcibly. If the first condition were wanting, we should have a voluminous pulse merely; if the second, a contracted one merely.

Hosack pertinaciously confounds quickness with frequency of pulse. To show plainly how far he is wrong, take the instance of an intermittent pulse, losing every alternate stroke. The eighty systoles of such a pulse, beating at the rate of 160 per minute, would occupy but one-fourth of a minute. But the eighty systoles of a regular pulse of eighty per minute, would consume half a minute—double the time.

These terms, then, the preternatural strength, feebleness; fre-

quency, infrequency; quick abruptness, slowness; fullness, smallness; hardness, softness; irregularity, will denote and comprise, in their numerous combinations, every possible modification of pulse, occasioned by whatever possible diversity of condition and circumstance. The divisions thus pointed out, have the advantage, too, of being founded in the very nature of the facts, coming under the apprehension of the intellect and judgment, and not like the artificial arrangements briefly alluded to above, built upon fanciful relations and resemblances, and addressed to the imagination and the memory.

Many practitioners, disgusted with such conceits, and throwing aside the complicated classifications of pulse-makers, have gone to the opposite extreme of too great simplification of this branch of pathognomy. Among these, were Dr. Wm. Hunter, and the justly celebrated Heberden; the latter of whom observes, in commenting on this subject, that "these minute distinctions of the several pulses exist chiefly in the imagination of the makers, and have little place in the knowledge and cure of diseases." He proceeds to limit the consideration of the pulse merely to its state of frequency, in combination with the other symptoms present—an error, against which I need not urge a single argument.

There can be no doubt that some persons are originally gifted with a much less delicate sensibility of touch than others, and are, therefore, unable to perceive nice degrees of difference, that make distinct impressions upon the senses of those better endowed. Yet there are many means by which we may increase and heighten the sensibility of the ends of the fingers; for this purpose, the hands of the physician should always be kept gloved, and never used in the performance of any rude mechanical offices; the habit of attending to slight sensations, should be cultivated, and a familiarity with every condition of the pulse obtained, by assiduously examining our own pulses, under all circumstances, and those of our intimates and the children immediately about us, from time to time, as often as is in our power.

I am by no means disposed to enter here, into a detailed consideration of the various modifications of pulses, yet there are a few so often met with or so clearly indicative of certain conditions, that they should not be passed over in silence. Thus, you will

frequently be called on to distinguish between an oppressed and a depressed pulse, to use the phrase of Sydenham and Rush—since whose time, the importance of the distinction is familiarly recognized. The oppressed pulse is small or contracted; it is occasionally less frequent than natural, though usually more so; it may be, though I think it is not often, quick, abrupt or jerking, and if examined carefully, will be found possessed of some degree of resistance and tension. It is not to be looked for, except in the earlier stages of disease, and in violent attacks, implicating the vital organs, and more especially the alimentary tube. Depletion, by the lancet or otherwise, will often, in cases of this kind, if timely and judiciously employed, develop the vascular action, rendering the pulse fuller, softer, and less abrupt. Here, the original difficulty probably, is to be found in the capillary system—the circumferential organs of circulation. The pulmonary capillaries refuse to pass or admit blood, sent towards them by the right ventricle, which is hence clogged and its systole impeded. The diastole of the left ventricle is imperfect, because it is not followed by a sufficient current from the lungs. Its systole is not deficient in force, but acts upon, and propels an inadequate quantity of blood; the arteries not having lost their tonicity, contract upon these their contents, and thus become small. The pulse is not weak, however, nor is the capacity of the heart for its contractile function impaired. The salutary effect of the lancet, and of other depletory and revulsive measures, is easily explained, by referring to their influence in relieving the pulmonary congestion.

The depressed pulse obviously depends on an exhausted and debilitated state of the central organ itself; or it may be, upon an actual deficiency of the vital fluid. It is met with when disease has gone on unchecked to the stage of wasting and prostration; it is small, frequent, soft and unresisting. To deplete a patient in this state would probably be a fatal error. A small or contracted pulse should always be examined with special attention, as the other combined qualities are evidently detected with more difficulty in proportion to its defect of volume.

A very treacherous pulse, and one which is very apt to mislead the careless and inexperienced practitioner, is the “gaseous” or “soap-bubble” pulse of Rush and Hosack—a compound of extreme

softness and compressibility, with a full voluminous roundness of the artery. It is a symptom of great danger; denoting that the tonicity of the vessel is destroyed, or so far impaired, as to render it unable to contract upon its contents, and diminish its diameter in due proportion to the feeble current propelled through it by the heart. It demands the free use of stimulants.

The vibratory or undulatory pulse, is not easy to describe. It gives to the finger the sensation of a fluid not passing fairly on, but checked in its progress for want of impulse, and returning, as it were, towards its source, like a reflux wave. It denotes the extreme of general debility of the circulatory power. I have seldom, if ever, seen an instance of recovery, after it had been distinctly observable.

Under certain circumstances, a natural or healthy pulse is one of the worst possible symptoms. The state of the circulation is, or ought to be, in relation to and correspondent with that of the other living functions, and the cause of disease must, indeed, have struck deeply and sure, to sever this sympathetic connection. Such a pulse I have found in some of our worst cases of yellow fever, and the malignant epidemic entitled pneumonia typhoides; it occurs also in the last stage of protracted instances of cholera, where the abdominal irritation has ceased in a great degree, and a stage of cerebral disease has supervened. It is appalling to meet with it—calm, regular, soft and full, when the system is sinking rapidly to decay, and the approach of death is every moment perceptibly hastening.

Intermission of the pulse, is a strange and often unaccountable phenomenon. It may observe a regular return, or occur irregularly. I have seen it in the sound and healthy sleep of a child, ceasing whenever he awoke. It occurs sometimes in old age, however sturdy; and as the sequela of accidents, fractures, dislocations, etc. It is often connected with dropsical affections, especially hydrothorax, and is readily produced by the exhibition of digitalis. As we should anticipate, it is a frequent attendant upon organic disease of the heart, or of the large vessels immediately near it, and their valves. I know of no important indications to be inferred from it.

In examining the pulse of a patient whose life is in your hands, let the remembrance of your responsibility be always

present to you, and direct your whole attention to the objects of your enquiry, abstracting yourself more perfectly, if necessary, by closing your eyes and requiring silence and stillness about you. See that there is no obstruction, either from clothing or position, to the course of the blood in the vessel. Feel the pulse not only on first entering the apartment, but repeatedly afterwards; the patient may be agitated either pleasantly or otherwise by your approach. Apply to the artery the most sensible parts of your fingers—two or three of them, and keep them applied for some considerable length of time. In doubtful or obscure cases, use the fingers of both hands, and examine the pulse, not only at the wrist, as is usual, of both arms, but at the temples, and on the top of the foot. Difference of determination, or local excitement, occasions an obvious difference in the force of arterial pulsations. When you have thus acquired the requisite information, con over the whole subject, and describe to yourself, in distinct words, the different qualities of the pulse as they have been impressed upon your sense of touch.

Proceed, then, to collate these with the other symptoms which present themselves, never allowing yourselves to be guided by any one series of phenomena exclusively. “The pulse,” as Chapman has prettily observed, “is our compass, and like that of the mariner has its variations.” We should, therefore, make every endeavor to correct, by other modes of enquiry, the errors into which these might lead us.

Having thus described as fully as our time permits, the morbid varieties of action of the circulatory organs, we come, next, to notice the condition of the blood itself. Anæmia and hyperæmia are significant terms, used to express the opposite states of defective and redundant sanguification. Anæmia is a frequent attendant upon maladies which affect the digestive powers, but exhibits no uniform or general connection with emaciation or atrophy. Consumptive patients are not always pale. According to Andral, the constitution of the blood is altered in anæmia uniformly by diminution of its “globular element;” occasionally, however, “we see the albumen and the fibrine of the serum diminish also with the globules.” It is occasionally met with in scrofulous marasmus and some dropsies. It affects girls of feeble constitutions at and just after puberty, when the changes of that

critical period have been imperfectly gone through. It is sometimes the consequence of large hemorrhages. The elaboration of blood is a complicated and delicate process, which, if much impeded or interrupted, is apt to be altogether abandoned by the organs concerned, as respiration when too long suspended. Hyperæmia or mere superabundance of blood, I do not believe to be possible, notwithstanding the views expressed by some pathologists, who seem disposed to identify it with plethora. Local hyperæmia is one of the most frequent symptoms of disease, being, of course, met with in congestions of every source and character, whether active or passive—whether irritative or inflammatory. I am not aware of any test by which a “general redundancy” of blood could be shewn to exist, or any circumstances from which it could logically be inferred. There is no standard by which we can measure or approach the measurement of a normal or regular proportion of sanguineous fluid in the vessels of a sound and healthy body; so we cannot pronounce upon the limit of such quantity. We know when any organ or organs are oppressed or deranged by undue determination of blood; but we never find all the organs thus oppressed at the same time.

Plethora, which shall be more fully treated of hereafter, is a relative term, and implies always a loss of harmony in regard to the condition of the vessels and the quantity and quality of the fluids they contain. “The blood of plethoric persons,” says Andral in his *Hæmatology*, “differs from ordinary blood in the greater quantity of globules and the much less quantity of water that it contains.”

We have scarcely any indication of the plethoric state, except the occurrence of hemorrhage, an event apt to alarm, but sometimes salutary, as relieving the condition of local hyperæmia, which almost invariably precedes it. Hemorrhage may be, to employ the familiar technical phrases, either active or passive; the former taking place in constitutions possessing elastic energy and free from exhaustion; the latter always indicative of danger as coincident with a relaxed state of the fibres and a loss of the elastic vigor of the system. This latter or passive hemorrhage is also not unfrequently occasioned by or consequent upon a change in the crasis of the blood itself, which either refuses to

coagulate or coagulates slowly and imperfectly, being thin and serous, and of a brownish hue rather than of the proper scarlet and purple. Such blood transudes, by simple diapedesis, from unbroken surfaces in the latter stages of our malignant fevers, and this constitutes as well a new mode of injury to the constitution as a token of a most unfavorable state of the patient.

The blood undergoes a great many other alterations in disease. Whether these are primary and characteristic, is the old question in dispute between the humoralists and solidists. Of their frequency, no doubt can be now entertained, and no one will deny, that some of them, at least, are characteristic. The buffiness and cupped state met with in the blood of persons laboring under inflammations of a variety of organs, and of pregnant women, is a familiar change, the nature of which, however, is not yet very clearly made out. It is accounted for, with some plausibility, on the supposition, that the coagulability or contractile disposition of the fibrine of the blood, is so far lessened, that the red globules are permitted to fall through the lymph instead of being entangled in it. But, we meet with blood which absolutely refuses to coagulate, as in animals excessively fatigued, and those killed by lightning, and, yet, this deposition of cruor does not take place. Besides this, I have bled patients laboring under inflammatory disease, in whom the contraction or coagulation of the blood was exceedingly prompt, which, nevertheless, showed this separation of cruor and fibrine. In a case of enteritis, the coagulation was so rapid that the blood hardened as it flowed from the vein; layers of lymph (the buffy crust) and red coagulum were thus interposed, stratum super-stratum, and intermingled so as to give to the mass the appearance of a mixture of purulent matter with blood, a resemblance noticed with great alarm by the attendants. You ought to bear in mind, the circumstances which modify and, to a certain degree, control this phenomenon of buffiness or siziness, as it is called.

If blood be drawn from a vein in a full projecting stream, and received into a small vessel with polished internal surfaces, it will often exhibit the crust, and its centre will be hollow or cupped, when, if suffered to trickle slowly from the same vein into a broad, flat vessel, roughened on the inner surface, no such

crust will be seen. From Andral, we have recently derived the most definite information concerning this, as well as many of the other phenomena of "Pathological Hæmatology." He ascribes the buffiness of blood to the "excess of fibrine relatively to the globules." "Except when it occurs in cases of anæmia, it uniformly denotes a state of inflammation." "In anæmia, the buffy coat results from the great diminution of the globules, for the fibrine, although in its usual quantity, is, nevertheless, in excess, relatively to the globules. But, in the phlegmasiæ, the globules are neither increased nor diminished, while the fibrine has become redundant."

In cholera asphyxia, the serum and salts of blood are very deficient, having been drained off by the albuminous discharges. In the last stages, when the case has been protracted with much cerebral disorder, I have met with a dark, thick blood, which refused to coagulate, having, probably, lost (as in the instances alluded to above of death from lightning) all its vitality, and, of course, its power of contraction.

You will find in the books, a very great variety of changes in the appearance of the blood, noted as occurring in various forms of disease. It is thin, incoagulable, brownish and fœtid in scurvy; in purpura it is of a dark hue, indisposed to harden, and oozing through the small vessels under the cuticle and upon the mucous surfaces. It has been found oily, and chylous, as though sanguification had been imperfectly performed.

It will be well for you attentively to examine all the blood you draw hereafter. Note carefully such striking changes as may be presented, and record minutely their connection with the other phenomena concurrent in each case.

III. Of the Respiratory Function. Dyspnœa is the general term applied to denote all forms of difficult breathing, whether continuous or paroxysmal; whether from mechanical impediment to the passage of air into the lung, or from spasm, or disorganization, or muscular debility. The use of the word orthopnœa indicates that the difficulty of breathing is increased in a recumbent, and more or less relieved by assuming an erect posture. It is assumed to give ground for the inference, that thoracic effusion has taken place; but it is not exclusively dependent

upon this condition, being met with in asthma, and other modifications of disease, where no fluid is imagined to be poured into the chest.

The respiration of the sick should always be observed attentively, and any remarkable disturbance of a function so urgently important, should be regarded with suspicion. In all fevers, it is unpleasant to find it either specially slow or much hurried. In the first instance, as in typhoid affections, we infer oppression of the brain, or exhaustion of the sensorial energies; in the latter, we are led to fear the occurrence of pulmonary congestions, or of such changes in the condition of the pulmonary mucous surface, as shall prevent the due action of the air on the blood. This happens in the more protracted stages of the same class of fevers when the bronchial tubes are coated with a dark, tenacious sordes, and the blood is black.

I shall not speak here of the affections of the respiratory organs and function, in relation to pulmonary diseases, properly so called, deferring all detail, on this head, until I treat of the exploration of the thorax.

Yawning and heavy sighs betoken an imperfect and sluggish circulation through the lungs. They attend upon the cold stage of intermittents, and connect themselves similarly with all internal determinations and congestions. Cough is a token of irritation of the air tubes, the trachea and bronchi, larynx, and sometimes of the fauces proper, as when it is occasioned by elongation of the uvula. It does not always attend upon such irritation, however. I have seen patients die of disease of these tubes, without having suffered from cough. It becomes necessary, to get rid of any fluid secreted or effused into the pulmonary cavities. Mucus, in immense quantity, is sometimes poured out into the lungs in old age, otherwise healthy, giving rise to what is known as the *tussis senilis*. Pus is expectorated also, under a great variety of circumstances. It not only collects in abscesses and exudes from ulcerated tissues, but is secreted by the vessels of an unbroken surface, as we see familiarly, in chronic catarrh and bronchitis.

In severe pneumonia, a rusty brownish mucous sputum is regarded as a bad symptom, much more so than a tinge of florid blood, mingled with the mucus coughed up. In gangrene of

the lung, a similar looking fluid is expectorated, but with extreme fetor.

IV. Of the Sensorial Function. The universal sympathies which connect, by means of the functions of the sensorial system, every organ of the body, more or less closely, with every other, occasion an almost universal disturbance of some portion of the nervous system, either in its centre or its circumference, to attend upon all the infinite varieties of disease. Every morbid alteration of action or structure, implies pain, with exceptions so few, that the rule may be laid down unhesitatingly. Pain, however, varies much, both in kind and in degree, not only in relation to the intensity of the disease with which it is connected, but to the general susceptibility of the patient, and the peculiar sensibility of the part. All these circumstances must be taken into consideration, before we proceed to deduce any inferences, either from the nature or amount of pain suffered. Nothing can be more embarrassing than the complaints frequently made to us, of extreme pain, where the closest examination does not enable us to detect any cause adequate to account for it, either in any apparent change of structure or impediment to function. This is the history of many obscure cases of neuralgia.

We judge generally, without difficulty, of the locality of disease, by the point to which pain is referred. This is, however, sometimes a deceptive index, owing to the complexity of nervous sympathies; thus we have pain at the top of the shoulder in hepatic inflammations, and pain in the knee when the hip joint is diseased. The sensibility of some parts of the body is so dull as to give no notice, even of the greatest changes of structure or disorganization. The parenchyma of the lung does not seem liable to acute pain from any cause; hence we may have extensive solidification and deposition of tuberculous matter, without the consciousness of any definite malady, on the part of the patient. Nor is the mucous membrane of the bronchi and air cells, endowed with any nice capacity of feeling, even when inflamed. The serous membrane, on the other hand, is exquisitely sensible during inflammation, if pressed or moved. Hence the severe pangs of pleuritis, or pleuro-pneumonia. During the progress of the most insidious cases of tuberculous

phthisis, our patients sometimes complain exceedingly of painful respiration, referring to some point of the chest, as the seat of intense suffering. This is occasioned by a supervention of pleuritis upon the original affection. On the other hand, the absence of pain in some diseases of sensible parts, and in violent cases of general disease, is one of the worst symptoms, as indicating the subversion of the ordinary nervous sensibility of tissue, or the general deficiency of nervous power. This state occurs in many malignant disorders. A patient in typhus gravior, and in yellow fever, will often tell you that he is quite well. It is sometimes met with in cholera and in plague. A degree of it is frequently evidenced by inattention to blisters and sinapisms. Impairment of the capacity of the organs of sense, is thus an unfavorable sign, in a great majority of instances. The books mention an exception, on which some stress is laid. Deafness is said to be a favorable symptom in typhus, but of this I am not satisfied. Disordered perceptions, from a morbid condition of the nerves of the same organs, give reason for the same unpleasant inferences. The appearance of motes before the eyes, dimness or confusion of sight, vertigo, strabismus, blindness, betoken some cerebral derangement. A permanent contraction of the pupil is usually attributed to inflammatory irritation of the brain or its membranes. In increased degree, this condition produces sleeplessness, pervigilium. Dilation of the pupil is said to point out the effect of compression, either vascular or extra-vascular, of that great organ, and is, for the most part, attended with drowsiness, stupor, coma, convulsions. Double vision is a singular, and sometimes apparently inexplicable phenomena. I have chiefly met with it in disorders affecting the digestive organs; it is spoken of by others as showing itself in hysteria. Some vegetable poisons produce it, as a drunken man is said proverbially to see double. I have been led to consider it as an affection of the muscular apparatus of one or both eyes, by which, their action being rendered unequal or disassociated, the axes of the eyes are not directed normally, the result being, of course, the reception of two images instead of one. Some poisons contract, others dilate, and others still, merely fix the pupil. Among the disturbances of the organs of sense, we must notice in middle and advanced life, the occur-

rence of tinnitus and other noises in the ears, as giving very useful warning of undue determination to the brain, and affording opportunity for warding off apoplexies and palsy.

The chill of an intermittent, and that which ushers in several of our forms of fever, is a phenomenon extremely obscure in its nature, and not to be properly explained, until we attain a knowledge physiologically, of the generation of animal heat. Some have attributed it merely to internal determination and congestion, but it bears no relation to the degree of this morbid condition, being often exceedingly severe in the mildest cases, and scarcely perceptible, or very slight, in the most malignant. I have seen patients die promptly of congestion, without shivering or complaining of cold.

A sensation of heat, when the surface of the body is actually cold, attends some dangerous diseases, such as malignant intermittents and remittents, and is a well known symptom in the collapse of cholera. The delirium of acute disease is generally unfavorable: it is less so when cheerful, lively and active, than when gloomy, sullen, passive—worst when, as in typhus, muttering and comatose.

V. Of the Motory Function. Paralysis, so often considered a disease of itself, is for the most part, a mere symptom, indicative of, and resulting from some affection, either of the brain or spinal marrow; and we may affirm the same to be true of almost all the varieties of convulsions, clonic or intermitting spasm. Cramps, however, (tonic, continued spasm,) spasms of infinite diversity, connect themselves prominently with diseases of the digestive tube. Hiccup, a diaphragmatic spasm, requires to be noticed here. It attends upon gastric irritations of varied character. In fever it is a bad symptom. Nothing is more common than to meet with cramps, and sometimes of great severity, too, in our ordinary colics and cholera morbus, and the importance to which cramp rises as a symptom of malignant cholera, is well known to you. It connects itself, also, with certain uterine affections, giving great annoyance throughout the whole course of pregnancy, and much suffering and embarrassment during labor.

Some of the poisons produce, by irritating the stomach, most severe cramps. Among them are the antimonials, and the effect

is so regular in certain individuals, that drugs of this sort should never be administered without previous inquiry as to their influence. The shivering or trembling, and chattering of the teeth of an intermittent, are as difficult to explain as the sense of cold, which usually, though perhaps not always, attends it. I have met with similar agitations in hysteria, and other nervous maladies.

Although a certain degree of muscular feebleness belongs, generally, to the history of disease, yet I would always regard as a bad symptom, an inordinate degree of weakness or prostration. Relaxation of the several sphincters, and the unconscious escape of the contents, either of the bladder or rectum, may be reckoned among the most constant of unfavorable signs.

VI. Of the Excretory Functions. The cutaneous perspiration, urine and fecal discharges, undergo some changes, in almost all forms of constitutional disease; and these are often so marked as to have forced themselves, from the earliest times, upon the notice of the profession. The dryness and harsh feeling of the skin, in fever, is frequently a special subject of complaint from the patient himself, who becomes aware of a comfortable change in his general sensations, as soon as his skin returns to its natural condition of moistness and softness. Beyond this well known febrile heat and dryness, there is, in our autumnal seasons, a peculiar pungent and harsh state of the surface, in some of the worst cases of our bilious remittents. I always regard it as unfavorable. It is still more strongly marked in yellow fever, hence called by Mosely, *causus*, *febris ardens*. Bad, however, as is this symptom, if in notable degree, the state of skin exactly contrasted with it, which occurs in examples of the same forms of fever, when the surface is cool, relaxed, and covered with a clammy moisture, is far worse. Rush says, that all such cases under his care died, and my own experience concurs with his assertion, as to the extreme danger attendant on them.

We have recorded, the history of a malignant epidemic more than once prevailing in England, in the fifteenth century, in 1483, 1485, and afterwards in 1551, and at the landing of Henry VII., in which the principal and most dreaded symptom was, an immense and irrepressible perspiratory discharge, which with its unaccountable preference of the English race, occasioned

it to be entitled *ephemera britannica*, *sudor anglicanus* or sweating sickness of the English. This preference was not, however, exclusive, as Armstrong and others affirm it to have been. Many cases of foreigners are alluded to by cotemporaries, (Jortin's Life of Erasmus) and indeed, it seems to have prevailed pretty widely in Germany. The fluid itself, which transudes from the skin, undergoes in disease diversified changes, becoming offensive to the smell, acquiring a yellow color, an acid taste, etc. I do not know, however, any definite conclusions to be drawn from these appearances, any more than from the various morbid hues which tinge the complexion and general surface of invalids, none of which are significant or characteristic, except the well known discoloration of jaundice.

The art of medicine was at one time little more than a series of inquiries into the state of the urine, the inferences to be drawn from the diversified appearances presented by this fluid, and the medicaments supposed to be indicated or called for, in correspondence with its changes; when the water doctor had, (as the steam doctor aspires to do now,) trampled upon all extended knowledge and scientific investigation.

Painting, poetry and prose, comedy and tragedy, may all be referred to, to show that the urine was then, like the pulse more recently, trusted to, as the most clear and comprehensive means of obtaining all desired information concerning the state of the system. For some time it fell into comparative, we might say almost entire, neglect and disuse; but at the present day, several ingenious writers are endeavoring to revive in some degree the old views of its importance as a symptom. In fevers, it is usually scanty and high-colored, and deposits an abundant sediment. Such is also the fact in some hepatic affections with or without fever. The suppression of urine is not to be confounded with strangury, which is affirmed to be highly favorable, when occurring spontaneously in the advanced stages of fever, or when brought on by our remedies. The former I doubt. True suppression,—the defect, that is, of the secretion of urine, is a very unfavorable circumstance, though not as uniformly fatal as some have asserted. It occurs in yellow fever, and very often in malignant cholera.

The extreme abundance of this excretion constitutes or be-

tokens a very unmanageable form of disease, probably a state of combined excitement and relaxation of the kidneys. In these cases, the characteristic constituent of healthy urine disappears, or seems to disappear, as in diabetes insipidus; and is substituted or disguised as in diabetes mellitus, by a corresponding amount of sugar. A transient diabetes attends upon many nervous maladies. In severe head-aches and in hysteria, it is common to see the urine poured out in great quantity, quite limpid and destitute of its usual odour and other qualities. Its various appearances are affirmed to be very constant tests of the states of the system in dropsical patients; especially the exhibition of an undue proportion of albumen, which coagulates when exposed to heat, and when acted on by certain chemical agents. Dr. Venables says, "if we wish to know the state of the kidneys, examine the morning urine. If diseased, but containing neither mucus, pus nor blood, we may conclude the kidneys to be the seat of the affection. If it contain mucus or pus, but otherwise natural, we may look upon the bladder as diseased. If unnatural and mucous or purulent, both kidneys and bladder are diseased. Yellow urine shows jaundice. Copper colored, very transparent urine, probably contains lithic acid. The steady presence of an undue proportion of albumen is apt to be connected with granular deterioration of the kidneys."

The physician who aims at a correct and comprehensive knowledge of the situation of his patient, must not neglect to inquire into the regularity and appearance of the alvine discharges. Indeed, there are few of the acute diseases of our warm climate and malarious districts, in which we can venture to omit the daily inspection of these evacuations. Constipation or diarrhœa will equally require to be corrected. An obvious departure from the natural fœcal qualities, will often suggest useful treatment, as where the whitish color shows defect of hepatic secretions.

The rice-water or albuminous discharges of cholera, are not altogether peculiar or characteristic, but occur now and then in ordinary diarrhœa, chiefly among children. Black stools are met with in yellow fever, and in some chronic affections of the liver and spleen, as also in enteritis. Mucous, purulent, ichorous and bloody evacuations occur in dysentery and local intestinal inflammations. In dysentery, we also meet with what are called

scybala, indurated masses sometimes merely fœcal, but at other times sebaceous, a circumstance unaccounted for. Mortification or gangrene of the intestine, is shown by a pink or brownish colored thin sanious discharge, peculiarly fœtid and sometimes corrosively acid.

In the cases of infants and very young children, a peculiar degree of attention to the alvine evacuations becomes necessary. They are subject to very numerous and diversified affections of the alimentary canal, demanding early and prompt relief, of which the fœcal changes give us the earliest and perhaps the only indications.

CHAPTER X.

SUBJECT CONTINUED.

"THE physician," says Holland, "who leaves the bed-room of his patient, especially in cases of fever or acute disorders, without attending to more than the prescription of medicines and diet, has very imperfectly fulfilled his office. He is bound farther to look to temperature and ventilation; the fit state of his patient's bed; his posture; the needful changes of clothing; the proper use of water for cleanliness or coolness; and the maintenance of quiet."

It has been often said that a physician must be a physiognomist. If originally endowed with a due share of sagacity and attention, experience cannot fail to make him one. The countenance of a patient is in a great number of examples fully expressive of his condition. You would at once draw an unfavorable inference, if it had undergone any striking change. Some of these alterations betray the state of mind; others are as clearly indicative of organic impairment. One could hardly mistake the thin clear cheek and bright eye of tubercular phthisis, or the haggard and sallow atrophy of malignant tumors and ulcerations. Sir A. Cooper says, he pronounced decisively as to can-

cer, from the visage and complexion. I feel a similar confidence in relation to it.

He who has once seen the countenance in yellow fever, will never forget it, or pass by, without startled attention, a similar aspect. The tense forehead; the muddy eye, suffused and watery; the mottled or livid surface, the dark flushed mahogany or bronzed cheek; the anxious expression of mortal terror, or the gloomy sullenness of despair; form a picture deeply impressive, as well as clearly indicative of fatal disease. The only white person I ever saw die of cholera, exhibited this aspect, so that if it were not for the previous history, I should have thought him moribund of yellow fever; the same portrait would answer also for the rapid and violent cases of pneumonia typhoides—the physiognomical character of malignant or pestilential maladies presenting indeed a most striking similarity.

In maniacal disorders, or cerebral inflammation, we meet with a stare of wild and furious defiance; on the other hand, a failure of mental energy is shown in a silly simper or an empty idiotic indifference.

The “*risus sardonius*” of the books, is described as a grim sarcastic smile, evincing some painful hallucination. It is said to be occasioned also by inflammation of the stomach or of the diaphragm.

The “*facies hippocratica*” consists in a hollowness and sunken appearance of the eye, a sharp and compressed nose, fallen temples, the forehead tense and pale, the visage thin and livid; so far as I have yet seen, it portends immediate death.

You will not omit to attend to the decubitus of your patient, the posture which he assumes in bed. You will be glad to see him choosing his position and changing it at pleasure. Restlessness and jactitation, however, are bad symptoms; in children, sometimes amounting to an incessant desire to move from bed to bed, and from one apartment to another. Confinement to any position is unfavorable; it is worst when he can lie only on his back, with the knees drawn up, and when he slides down to the most dependent part of the bed. Towards the close of life, he seems to see minute objects in the air above him, catching at them, and picking the bed-clothes, his nails and fingers.

In your conversations with those under your care, always

take note of their remarks, as indicative of the state of their minds. You will of course regard as unfavorable, any striking change in the voice or manner, or any considerable deviation from the usual mode of thought or expression. It is always proper to make formal inquiry into the history of the attack, and the time and circumstances of its access; it may be a matter of some consequence to be informed on this head, though it is by no means of the paramount importance ascribed to it by certain writers of high authority, who almost advise that you should not prescribe for your patient, until you discover what has made him sick. I would rather direct you, with Rush, to prescribe for the symptoms before you—yet with this proviso; that you consider them collectively, and not separately or partially.

In pursuing these investigations, encourage your patient to give you a full detail of his sufferings; in the progress of which he will scarcely fail to let fall some statement essential to the designation of his actual disorder; this you can follow up by judicious questions, directed to the points on which you wish to be satisfied, taking care, however, not to frame them in such a way as to suggest any specific answer, as many persons are exceedingly apt to return you whatever reply they may think you are aiming at. This is especially true of our negroes, who will attempt shrewdly enough a description of any ailment which they imagine you to expect or anticipate.

Never take your leave abruptly; besides the courtesy and indulgence of a conversation so interesting to the person concerned, you will often derive from desultory remarks, not a little advantage and assistance in the comprehension of a difficult case. Do not shut your ears to the observations incidentally made by his nurse or attendants, and his friends; they may very possibly contain hints that shall prove servicable in your management of the patient. Thus advises the sagacious and philanthropic Rush; adding as a reason for the conduct thus recommended, that “knowledge is a treasure too valuable to be ever rejected; no matter by whom, or in what manner, it may be offered to us.”

Periodicity, or the tendency to observe a regular and well defined routine in their course, is a property or quality which may be ascribed, perhaps, with little or no impropriety, to a

large majority of the long catalogue of human maladies. Their general progress, their increase and decline, will be found, in the mass of examples, to bear a more or less precise reference to the process of time occupied in the development of the several changes of condition in which they consist. They remit and intermit; the patient grows worse or better; they reach a determinate acme, and come to an end favorably or unfavorably.

These periodical changes or revolutions in the history of disease, are, indeed, among its most singular and impressive phenomena; and the physician who does not pay a due and careful attention to them, will make little advancement in the practice of the art of healing. Hence, I have been led to regard them as worthy a separate consideration in this relation.

The system is subject, in a state of entire health, to diurnal revolutions of great regularity. We govern ourselves in all our habits and customs, whether personal or social, as if instinctively, by the progression of the hours. The disposition to sleep comes on at night-fall; we wake after a certain time, and rise in the morning from the posture of repose, newly prepared for the ordinary duties of the day.

The pulse is found by experimenters to vary notably in frequency and force, when compared in the morning, at noon, and again at evening. Plants are said to sleep; and if this idea be deemed fanciful, we know it to be fact, that their respiration, so to speak, their action upon the atmospheric air, is different by night and by day; whence, we have a right to conclude, that an analogous difference in the functional action of the skin and lungs holds good in the life of animals also—especially if we reflect on the well known and extensive chemical influences of the sun's rays. It would be strange, indeed, if every function and organ of our susceptible mechanism did not respond harmoniously to the play of light and darkness—of night and day.

Prout tells us, that more carbonic acid is formed in respiration from day-break to noon, and less during the remainder of the twenty-four hours. "The electricity of the atmosphere," says Holland, "appears to undergo diurnal changes—the positive electricity being stronger in the day than in the night, with subordinate increments and decrements also during the day. The in-

fluence of these may not be great; but some effect they must have, and we have no means to appreciate its amount."

The same principle is still more strikingly exemplified in the state of disease. A diurnal revolution, or definite series of regular changes, is almost universally observable, and these changes are found to correspond, with wonderful precision, to the progress of the hours.

In the most continued or continuous fevers, there is, very certainly, an alleviation of the symptoms at one period of the day—the morning usually, and an evident exacerbation at night. The vomitings of pregnancy, although alleviated throughout the day by the recumbent position, are always most troublesome in the mornings, when that position has been longest preserved.

But this diurnal revolution is not all, and we have a long catalogue of facts proving the existence and influence of what may be called a specific and positive principle of periodicity, varying in its history and application with the nature of the morbid cause which is supposed to develope and impress it. Can the menstrual discharge, with all its annoying necessities, be regarded otherwise than as an infirmity, and, to speak strongly, a periodical symptom or state of disease? The regularity of the return of this excretion, or of the uterine congestion which it relieves, and of which it is the result, is matter of the most familiar remark. It obeys a law of recurrence, admitting of little or no modification from climate, tribal variety, diversity of condition, state of society, national or personal habits. The vicarious hemorrhages, sometimes substituted for it, also obey the laws of periodical recurrence and regular interval.

Intermittent fevers, preserving their characteristic types, return at determined intervals, from a few hours, to alternate days and weeks, by a law whose force and energy can be exactly calculated. The quotidian presents itself daily; the hectic frequently twice a day—each keeping its paroxysmal time of access. The tertian, the quartan, are equally well known. Occasionally they observe still more distant intervals, and we have cases on record of what are called septimans, octimans, and decimans. The hebdomadal period seems to be not an unfrequent one, and the influence of the septenary revolution is almost as well marked

as that of the diurnal. The catamenia derive their name from the coincidence with the time occupied by the lunar changes, which are divided off by periods very nearly weekly; and a large majority of their postponements, or anticipations, are on the same scale of hebdomadal arrangement. So it is with the returns or relapses of our malaria fevers, which I have observed very generally to take place on the seventh and fourteenth days.

It is, indeed, to the agency of these revolutions combined together, concurrent, or modifying each other, that we are to attribute, I think, all the circumstances which have given rise to the belief in the influence of what are called critical days in fever—that is, of days on which there is exhibited a special tendency to crisis or solution of the disease. The doctrine is as ancient, at least, as the era of Hippocrates, and has met with many able and ardent supporters. We shall discuss it more fully in another place.

The influence of this potent principle of periodicity is shewn in another mode, to which your attention should be earnestly directed. It is perfectly well understood, that several of our most common diseases run a given course, and terminate at a given time and in a definite manner, which can be calculated and predicted with every reasonable degree of certainty. Thus, rubeola comes to a spontaneous termination, in the great mass of cases, increasing, attaining its acme, and subsiding within eight days; and we affirm, with regard to variola, scarlatina and vaccine, etc., that they progress, grow worse, reach their height, decline and disappear at familiar times, with entire regularity and under familiar circumstances.

Of late, the list of “self-limiting diseases” has received very large additions, at the hands of writers of high authority. In their speculations upon the subject, however, these gentlemen seem to me, to have been misled, either by an original inclination to the “*medicine expectante*,” or by the failure of their therapeutical experiments. Bigelow and Smith, in our own country, and the celebrated Louis, in France, have ranked typhus fever or “typhoid affections,” as the phrase is, under this head; and the latter, the father of the “numerical system,” has gone so far as to maintain the same views in reference to peripneumony and other phlegmasiæ.

It is, perhaps, unnecessary to warn you against an extreme so gross; but, a few moments may be well spent in the investigation of this question, and the removal of some of the difficulties which lie in the way of the clear development of the truth in regard to it.

The first source of error here which I shall speak of, is the striking misapplication of terms. In Bigelow's brief but ingenious treatise on this class of affections, he uses the term "self-limiting," promiscuously with "obstinate," "irregular," and "incurable,"—that is, he has enumerated almost all obstinate, irregular and incurable forms of disease as "self-limiting." Thus epilepsy, angina pectoris, asthma, mania, and even verminous disorders are designated—with what propriety, let reason decide. Such cases as these, are, on the contrary, as far as we are aware, totally indefinite in duration, unyielding in tenacity, know nothing of regular progress, acme, decline, subsidence, disappearance. They are either curable, (and, in this contingency, they differ very widely among themselves, even when known by the same name,)—they are either curable, and thus limited by art, or, as must be acknowledged to be too often the fact, unmanageable, whether essentially, or from coincident circumstances, and absolutely unlimited. In no sense, then, are they entitled to be placed under this category.

Secondly. Smith, Louis, Blane, and others, have considered certain diseases as "self-limiting," because they did not succeed in checking, or, to use the new word of Gallic authority, "jugulating" them. But this ground is untenable in itself, and, besides, is continually shifting beneath their feet. Gout and intermittent fever, were both of them, before the discovery of their appropriate remedies, regarded as uncontrollable; and, in their despair, men had actually persuaded themselves, such is the accommodating flexibility of the human mind, that they were not only inevitable but salutary inflictions. Podagra was trusted to "patience and flannel," and the sufferer found consolation in the belief, that he had purchased a new "lease of life" at every access, although, as one of its martyrs complained, "it might be at a rack-rent." But every practitioner now knows, that not only the paroxysm has been brought under control, alleviated, shortened, and brought to an early subsidence by judicious regi-

men and appropriate treatment, but that a menacing and forming attack may often be arrested and cut suddenly short by colchicum, veratrine, and the patent formulæ of Husson and Wilson.

Intermittent fever, long "self-limiting," in the proper sense, as to the paroxysm, and indeed until recently, very seldom disturbed in its possession of the patient; absolutely unlimited, too, in duration or recurrence before the discovery of cinchona—intermittent fever is now checked in the invading stage by V. S., by piperine, by opium, etc., and is rarely allowed to recur more than once or twice since the preparation of the sulphate of quinine—perhaps the only specific known to us.

With all the admirable patience, and indefatigable diligence of Louis, the profession has not come to repose an implicit confidence in his numerical observations; surely not in the therapeutical conclusions he has ventured to draw from them.

Notwithstanding his array of tabular proofs, that inflammatory diseases run their course unchecked by the interference of art, we put an end daily to pleurisy with the lancet, with antimonials, and with opium. Indeed, his own countryman, Bouillard, attributes the results exhibited by Louis, to his timidity and the inefficiency of his mode of depletion, and speaks triumphantly of the contrasted benefits of bleeding "*coup sur coup*;" a practice long since familiar to every American student of medicine.

In regard to typhus, I think the same remarks applicable. I acknowledge the tenacious and intractable character of this terrible form of fever; I admit the frequent ill success of the most skilful, attentive and experienced physician.

But when I compare, on any large scale, the results of the merely palliative or expectant mode of treatment, with those of the perturbing, the Hamiltonian, the mercurial, or the eclectic, I cannot but be struck with the difference in favor of the latter. I do not speak now of the comparative mortality, although I believe it to be decidedly lessened by active treatment judiciously adopted—that question is entirely irrelevant here; it is of the average duration that we are to inquire, and I have no doubt that it will be found to be materially abbreviated.

Typhoid affections, allowed to run their course unchecked, seldom subside before the thirtieth, thirty-fifth or fortieth day;

may, they are known to extend far beyond this period. Under the perturbing modes of management, on the other hand, whatever may be said of their ultimate proportional success, I do not think it difficult to prove that convalescence is occasionally, though perhaps rarely, established in the second week; often commences in the fourth, and not unfrequently as early as the third week; so that I hold it fair to rate the actual difference, the amount of time gained on the whole by a judicious therapeutic, as not less than from ten to fourteen days.

The mercurial treatment, when well adapted and efficiently pursued, is often seen to substitute a new and transient malady, of brief duration and ready spontaneous subsidence, for the dreaded pestilence of which we have been speaking. It will suffice to place in a clear light the broad distinction between the two classes of disease, to try the same experiment with any acknowledged case of "self limiting" character, small pox for example, or scarlatina, or measles, in which we shall surely find pyralism, a gratuitous, most useless, nay, a positively injurious addition to the essential phenomena of the malady, which it will neither supplant nor modify, and to the sufferings of the patient; neither shortening nor prolonging, controlling nor enhancing the characteristic symptoms.

There are certain paroxysmal affections which have been dwelt on in such a way, as to occasion a degree of confusion here; asthma, epilepsy, and angina pectoris, may be taken as examples. These are confessedly obscure in nature, history and origin. They depend sometimes, as it would seem, upon obvious organic change in certain structures and tissues; and at other times occur, unconnected with and independent of all such change, or as far as can be discovered, any thing similar or analogous to it; nay, they appear occasionally as symptomatic of disease, in organs whose appropriate functions seem little or not at all affected by such disease, as in angina from gout or from gastric disorder, and epilepsy, with some forms of aura.

Now, a single paroxysm of such a malady may, perhaps, be looked upon as self-limiting—a point which we shall discuss directly—but I cannot imagine any ground upon which to place their claim to be considered in this light, relatively to their recurrent tendency, which constitutes so essential an element in

their history. At any rate, the various cases of the same disorder differ so greatly, in this respect, that nothing can be allowed to be affirmed as uniformly belonging to their fullest development. Epilepsy, for instance, what is it but an effect ceasing if its cause can be removed. If functional, that is, unconnected with any organic deterioration, it is often cured; nay, there are cases on record, in which it was arrested in spite of the permanence of the structural lesion on which it depended, or seemed to depend. When symptomatic of verminous or dental irritation, we do not often find it difficult to relieve. Asthma is much alleviated, and a paroxysm frequently cut short by V. S., lobelia, coffee, sumach, tobacco and opium, and its tenacious hold loosened by change of air or alteration of the habits of life. If angina pectoris depend upon customary excesses, or on a gouty diathesis, it is often in our power to remove it by regulated and temperate diet, and by the remedies for podagra.

I have charged my opponents, in the present discussion, with carelessness or impropriety in the application of terms, and with total indifference to the selection of proper tests, and the establishment of cognizable distinctions. For example, Bigelow speaks of salivation from mercury, of inflammation from injury or wound, and of other cases of the direct influence of powerful morbid agents, as "self limiting diseases." But nothing can be more obvious than the difference between them. If we persist in the administration of opium, or mercury, or antimony, or arsenic, we can protract or continue indefinitely the effects produced—as when we keep a seton or issue open; on withholding or removing these causes, their effects will subside slowly or rapidly, according to circumstances, but by no means calculably or at a definite period. On the other hand, if we insert small pox matter anew into the skin of a variolous subject, or subject such a patient, or one laboring under measles or scarlatina, to the continuous action of the most concentrated contagion, the original symptoms cannot be prolonged in their course, but pursue steadily a well known and determined progress, and come as obstinately to a conclusion, as they persisted in extending themselves and reaching their culminating point or period of greatest intensity.

It is asserted by some modern medical sceptics, and more especially by Sir Gilbert Blane, author of the misnamed "Medical Logic," "that the more we study, practice and understand our science, the longer we shall find or make the list of self-limiting diseases." This I deny indignantly, and on the contrary, am fully satisfied of the reasonable hopefulness of the opposite opinion. And I protest deliberately against the assumption, totally groundless, but so often made without any argument, that a "self-limiting" affection is of necessity uncontrollable by art, and beyond the reach of our resources. This notion is at once overthrown, by a reference to our triumphant power over intermittent fevers and some other periodical affections, more probably of a neuralgic character, by cinchona, opium, arsenic, piperine, etc. Let us take care to avoid the confusion into which they would throw us here. Some, I grant, of the self-limiting diseases, are not to be in any degree abbreviated. I readily acknowledge the importance of making the proper distinctions, and of drawing the line between maladies curable and incurable, when this can be done—between those which are in any sense, under the control of our art, and those which lie absolutely beyond our reach, and must be abandoned or let alone.

To establish the totally hopeless character, however, of any class of cases, we should require, for the sake of humanity, irrefragable proof. Let us, then, pursue the inquiry, and follow with unhesitating footsteps, whithersoever truth may lead us.

In relation to this topic, we may arrange diseases under three heads:—the Self-Limiting, the Doubtful or Irregular, and the Unlimited.

1. The first class, the "Self-Limiting," comprises all the exanthemata. These come to a conclusion, (for this is the only true test,) within a definite period of time, by an inherent and irresistible law—a proclivity of a peculiar and specific character. Such is the fact with small pox, vaccine, measles, scarlatina, dengue, pestis. To these I would add parotitis or mumps and yellow fever, as subsiding uniformly at a calculable date, and incapable of being prolonged a single hour.

2. Of the doubtful or irregular, it may be remarked as singular and worthy of your attention, that we shall find here all those maladies that have had an uncertain place assigned them

among the eruptive fevers. Here are typhus fever and the typhoid affections of Louis, of which some affirm and others deny the essentiality of the cutaneous eruption; pertussis or whooping cough, which Watt declares to be attended with a characteristic eruption on the bronchial mucous membrane; cholera, of which Horner distinctly affirms the coincidence of a vesicular eruption on the gastric and intestinal mucous surface; and erysipelas, which is placed by good authority both among the exanthemata and out of that list. To these I would add catarrhal fever, which certainly has a tendency to spontaneous subsidence in a definite period, but which admits, at least when occurring sporadically, of renewal upon re-application of its causes. There are circumstances of analogy in the instance of pertussis or whooping cough, which perhaps deserve a moment's notice. It is liable to be renewed after it seems to have subsided and is about to disappear, by the application of certain exciting causes—as cold and moisture. For this reason, perhaps, it is difficult, if not impossible, to calculate its duration, even when left entirely to itself. Bigelow, who of course ranks it as truly self-limiting, goes on most inconsistently to say of it, “it has its regular increase, height and decline, occupying ordinarily from one to six months.” Surely no malady is more uncertain in its progress than this—from gonorrhœa to phthisis—from whitlow to hydrophobia. Granville tells us, that since the application of prussic acid in its treatment, no case need to be allowed to last longer than eight days; but this vaunt is not sustained by any confirmation.

3. Among the unlimited, I arrange all that have not been named—whether curable or incurable; for as I have said, that is a matter totally irrelevant. Cancer and scrofula may be made to head the repulsive list, which will include all the phlegmasiæ—fevers generally, speaking of them in reference to their tenacity or tendency to definite subsidence spontaneously—and a very large portion of the neuralgic affections, which may be paroxysmal and intermittent, but are illimitably tenacious and enduring.

As to our hopes of successful interference with and therapeutical management of these several classes of diseases, a just medium must be sought between the indolent vacillation of those on the one hand, who fear too much from the interposition of

art, and expect too much from the restorative processes of nature; and the sanguine imaginations of those on the other, who "rush in" where sages "have feared to tread," pouring profusely, with venturous hand, "drugs of which they know little, into bodies of which they know less." Having ascertained by a long series of observations, that certain maladies will, within a definite period of time, subside and disappear, and in the large mass of instances terminate without loss of life, lesion of structure, or serious impairment of health, it is surely the part of wisdom to interfere with these no farther than by the cautious subtraction of causes of excitement, and the removal of irritating agents, to palliate the violence of the regular or constituent symptoms; while we watch to prevent the intrusion of any new or accidental disturbance, the complication of any unessential disorder. It is on these principles that you will by and bye find I have directed myself, and propose to guide you, in the treatment of scarlatina, small pox, measles, etc. Yet even among this class, there may be maladies so dangerous in their tendency, so often fatal in their immediate results, as to justify, or indeed demand the resort to whatever perturbing agencies may interrupt their course, or disturb and break the series of morbid actions in which they consist. Yellow fever, for example, whose proportional mortality, when left to itself, is, notwithstanding its transient course and prompt termination, so truly frightful, requires at our hands the most active interposition as matter of conscientious duty. In the mass of cases, no treatment can be so bad, no perturbation so destructive, as the ordinary course of the pestilence unobstructed.

And again, cases belonging to a much milder and less fatal category, may prove exceptions to our rule of mere palliation. In catarrhal fevers, whose course is on the average a septenary revolution, the expectant method is usually safe and proper. But an extensive experience both among the vulgar and professional observers, has shown that, especially when occurring sporadically, its first advances are, owing to something in the very nature of the case, easily and with no risk repulsed, and that opium and other stimulants, can turn back its advancing wave. And the same thing is true of the paroxysm of a malarious intermittent, which may be arrested in its onward march by V. S.,

by opium, piperine, quinine, the tourniquet, etc., etc., almost as certainly as we please to make the effort energetically.

With the Doubtful or Irregular class, I interfere habitually, unhesitatingly, and with an activity proportioned to the apparent violence of the attack; believing them all capable of important modifications, in every way, intensity, duration and results, by judicious treatment. I believe that it depends much on the courage and sagacity of the physician, whether hooping cough shall last "one month or six," erysipelas six days or six weeks, and typhus three weeks or two months; setting aside still, as irrelevant here, all reference to probable results in proportional mortality. That malignant cholera, however largely fatal, is susceptible in a notable and encouraging ratio of instances, of being arrested at every stage of its progress by proper treatment, no man I think will question, after a perusal of the records of its unbroken mortality,* before art had mitigated its horrid features in India.

I need surely say little as to the propriety and prospects of medical interference in the phlegmasiæ, generally, and in the long list of Unlimited maladies. He who doubts the ability of the profession to cut short an attack of pleurisy, of enteritis, of dysentery, hepatitis, of colic, mania a potu, diarrhœa, etc., etc., should seek employment and reputation elsewhere than in the ranks of our profession. And although some diseases are as yet opprobria medicorum, as hydrophobia, tetanus, and that obscure affection which we call chronic rheumatism; and numerous instances of the most simple and seemingly curable disorders end in death in spite of our best skill and most assiduous attentions, yet we have the consolation of knowing, from the most authentic sources of information, the most accurately digested statistical tables, the most carefully prepared calculations of the improving chances of life, and the progressively elevated standard of its medium duration, that the evils against which we are contending undergo a steady diminution, and that our promethean efforts for the good of our fellow men are very far from being altogether fruitless.

The periodical movements which we are discussing, are clearly of two kinds, so obviously diverse that we cannot help referring them to two modes of periodicity. The first series connect

themselves distinctly with the diurnal and other regular habits formed in the system, and if not produced by the same causes, are evidently much influenced and modified by them. These furnished the exclusive ground for the explanatory views offered by Cullen, and accepted by Reil, Bailey, and others. But such views are partial and unsatisfactory, and fail entirely to comprehend the second series of phenomena, those namely, which are impressed by the characteristic properties of the cause that produces them, or brings on the malady of whose essential history they form a part.

These deserve more consideration than they have yet received at the hands of pathologists. Whatever the nature of their efficient cause, it is clearly the same with that which gives self-limitation, determining the end as well as the intermediate steps of the whole morbid process. Here we are treading on the burning cinders of angry controversy, and have crossed the line which separates the modern purist from the ontologist. But let us adhere closely to facts and we may well venture to be indifferent to names. Truth is as fully armed against taunt and ridicule as she is against false logic.

There is an obvious difference on the very surface of the cases. Take the instance of hectic, on the one hand, arising from the irritation of an injury or wound; we may imagine a fair correspondence between its symptoms and history, and the regular movements of diurnal habits in the body.

But what shall we say, on the other hand, of a malarious tertian or a quartan? We know of no reason for a suspension of the influence of diurnal revolutions on the alternate days of intermission in the first, or for its longer suspension in the second. We know of no example, as Watson reminds us, "of a bidual habit," that is, a normal or physiological habit observing a two days period. Still more obscure are the periods of the double tertian, whether duplex or duplicata. The regular correspondence of the alternate paroxysms, and their perfect distinctness from their concurrents, constitute, in my judgment, very strong reasons for doubting the soundness of the modern philosophy, which shrinks so fastidiously from acknowledging the essentiality of diseases, and indeed refuses to regard them in any sense as entities.

Willis formerly spoke of the development of some morbid

matter requiring to be eliminated. The profound and sagacious Holland uses language not very far different in its purport, when he says, "We can scarcely avoid the admission of some morbid matter generated in definite periods of time, the phenomena not coming on till the accumulation or maturation has reached a certain point, carrying away in their progress the active causes of disorder, whatever it may be, and thereby producing the interval that ensues." This is sufficiently ontological, and will apply well enough to the history of the exanthemata, and indeed all fevers, perhaps, which have been long supposed to be the natural means of throwing off something oppressive to the system. But we have periodical affections of other forms than the febrile, such as the inflammatory and the nervous. I shall tell you by and bye of regular paroxysms of apparently inflammatory disorder of the frontal sinus and antrum of the cheek, connected with catarrhal fever, but of distinct quotidian type. Neuralgia in all its varieties is often, as we know, regularly recurrent as well as paroxysmal. Here it is suggested that excitability has become accumulated, and is exhausted by an attack and an interval thus given.

Hemorrhages are sometimes very regularly recurrent; this is perhaps occasionally true of each, but has been most frequently remarked of hæmoptoe. Perhaps we may frequently be satisfied to account for this exactness of return, by a reference to a supposed accumulation of blood, manufactured in undue amount, but this explanation cannot always satisfy us. Some hemorrhages occur in subjects positively anemic, and in these are controlled with peculiar difficulty. Here we are again obliged to recur to the doctrine of a definite law or principle of periodicity, of the existence and force of which, as a natural power, active both in health and disease, we cannot longer entertain a doubt.

The source or sources of the various phenomena, thus referred to periods of time with which they are coincident, must be confessed to be hidden in the darkest obscurity. Apart from those which I have already spoken of, as dependent upon, and perhaps forming essential characteristics of the morbid poisons which give rise to paroxysmal and periodically recurrent maladies, I cannot hesitate to consider the sun and moon as at least the principal, most obvious, and most important agents in the

production of these phenomena. To the first, I would refer the diurnal, to the second, the monthly and septenary revolutions.

These bodies display a wonderful power over vast masses of inanimate matter, and thus exert, at least indirectly, an unequivocal control over all nature, animated as well as inanimate.

The sun may well be termed the soul of the universe. Not only do the planets revolve around him, and the comets, bound by an invisible chain, return from the extremities of their eccentric orbits towards him; but the most minute insect looks up to him for life and enjoyment, and the humblest plant creeps to the nearest inlet of his light, drinks in with his beams new vigor and beauty, and perishes when deprived of his kindly ray.

The moon governs with unvarying laws the motions of the immense volume of waters which cover so large a portion of the surface of our globe. That by the agitation and displacement of these vast tides, the rolling of these ocean currents, which must create ærial currents in every varied direction above them, she must exercise a powerful influence over the condition of the atmosphere, hygrometrical, barometrical and thermometrical, electric and magnetic, the winds, the variations of weather, is not more a matter of ordinary and universal observation, than consonant to reason and probability. But this obvious indirect agency it is asserted is not all. Farmers tell us that her phases silently affect the various stages of vegetation; and many other of the operations of the natural world are affirmed to go on in exact correspondence with the times and seasons of her ordinary changes. It will not suffice to sneer at such statements; they are questions of fact, and are only to be decided by patient, impartial, accurate and extensive observation.

The influence of these great luminaries upon the conditions of disease, has been, from the earliest times, believed to be notable and direct; and in all ages the doctrine has numbered among its supporters, men of the first rank and eminence as medical philosophers.

As to the immediate agency of the sun in the production and modification of the varied constitutions, diseases, and predispositions to disease of the several races, tribes, and families of man, and even of individuals, it has not been, nor can it be subjected to a reasonable doubt.

Concerning the alleged lunar influences, however, there has been much discussion and dispute, and the question is highly entitled to your attentive consideration. The doctrine, though in modern times it cannot be said to have been generally favored by the profession, has not wanted, even recently, the support of great names. Dr. Mead advocated it skillfully and ingeniously, and with great learning applied to it the explanations of the Newtonian philosophy. Darwin invested it with the beautiful colorings of his poetical imagination, and dexterously interwove it into the web of his fanciful hypotheses. Balfour contends for its truth in the most confident and positive manner, and succeeds in exhibiting his theory in a very plausible point of view. Moseley strenuously maintains the same opinions, and enforces his reasonings on the subject by the recital of some pointed and well marked cases, highly pertinent and interesting. Robert Jackson, whose sound good sense gives weight and authority to all his conclusions, admits the inference to be unavoidable, that "the lunar changes, or something connected with them, are to be considered as governing the invasion and type of various diseases." J. M. Good remarks, that "there cannot be a question in any impartial mind, that under certain circumstances, and especially in tropical climates, many diseases are influenced by lunation, as we are sure they are in all climates by insolation."

There is, however, it must be confessed, a deficiency of facts sufficiently clear and relevant upon these points. Much yet remains to be ascertained and collected in medical astrology. Close and long-continued observation is requisite to bring together the materials, and place them in the hands of some medical Newton; who, perceiving the relation and fitness of the detached phenomena, shall, like the immortal philosopher whom I have named, connect the whole so as to complete a vast and beautiful edifice—an imperishable temple of truth.

I ought hardly to quit entirely this general consideration of the subjects of pathology, without at least attempting a brief sketch of the condition of Convalescence.

Relieved in some measure from the oppressive action of the morbid cause which has effected him, the convalescent invalid is still in many senses of the word—a patient.

Although the peculiar or characteristic symptoms of his disease

have been checked or controlled, or have subsided or past entirely away, he still presents obvious tokens, in the infinite majority of cases, of disordered and imperfect performance of some of the functions of the organism. His digestive system slowly resumes its tone; strength follows gradually upon increase of appetite and assimilation of nutriment; his countenance, voice and manner return by imperceptible steps, to their accustomed standard. He endeavors languidly to rise from the recumbent posture in which his enfeebled forces had instinctively sought repose and refreshment; his mind, regaining its energies as his bodily vigor improves, he seeks amusement and employment in his former avocations, and takes up one by one his ancient habits and modes of living.

But his situation is singularly precarious, and if attentively regarded, he will be seen to be yet trembling on the verge of a precipice, over which one false step will precipitate him inevitably. His system has all the mobility of that of the infant, without the safeguard of insusceptibility, with which nature has gifted our helpless offspring as the most efficient means of protection. He is, on the contrary, affected by the very slightest and most transient impressions. Nay, even the thrilling consciousness of returning health disturbs, excites and agitates him.

"See!" exclaims the poet Gray,

"See the wretch, who long has tost
On the thorny bed of pain,
At length repair his vigor lost,
And breathe and walk again!
The meanest floweret of the vale,
The simplest note that swells the gale,
The common sun, the air, the skies,
To him are opening paradise!"

He is often sleepless, perhaps from this excitability; morbid vigilance forms one of the most annoying evils of his condition; and when he slumbers, he dreams much and unpleasantly, and is thus frequently startled and awakened. Easily fatigued by any exertion, he is nevertheless unwilling to abstain from the muscular efforts of which he begins to feel himself again capable. Nor can he restrain the restless workings of his mind, which suffers from fretful impatience of inaction.

It is not of course in place here, to lay down precise rules for

the management of the convalescent. This must of necessity be done with immediate reference to his recent illness ; the circumstances of suffering just past through ; the nature of the causes of disease, both predisposing and exciting, which have acted upon him ; and the history of the attack, in all its complications, of which he has been the subject.

He cannot be properly said to be emancipated from your government, or you to be released from your responsibility in the treatment of his case, until he is found capable, both mentally and physically, to enter once more upon his ordinary modes of living, and to perform his accustomed part in the social offices of his sphere.

You are to control and direct the successive steps by which he is to regain his former position in active life, and to proportion the exertions he is to be permitted to make, to the amount of strength which he may be presumed to accumulate from day to day. Nor will you find the questions proposed to you by himself and his friends on these points, of easy or indifferent decision. To form a correct judgment upon them, will be of much importance to his welfare and to your future reputation. They will or ought to be, then, matters of earnest consideration to you ; for while your patient remains in this state of combined feebleness and mobility, your task in his management is but half accomplished—your duty but half done.

I am confident however that you will find, in your own feelings towards him, abundant inducement to regard him with the most jealous and careful assiduity. What social relation can there be involving a warmer interest than that which subsists between the successful practioner and the convalescent, still suspended in the transitive condition between life and death ; rescued, under his skilful attention, from the very jaws of the grave, and happily restored to hope, friendship and love ? Words should and must be weak to express the ardent gratitude of the reviving sick man to him to whom, under Providence, he owes life and health and the renewed capacity of enjoyment ! And how delightful the generous complacency and subdued exultation which expand the heart of the physician, who feels himself, in a certain sense, the author of these blessings ; undeniably the happy instrument through whom they have been conferred.

PRACTICE OF PHYSIC,

OR

THERAPEUTICS.

CHAPTER I.

NOSOLOGY.

IT is neither consistent with my inclination, nor with the pressure of time, which must be devoted to objects more worthy your attention, to enter here into a detailed discussion concerning the arrangement or classification of diseases. A few observations are, however, necessary to explain to you the plan which we are to follow in treating, successively, of the several subjects about to come under our notice.

It has been warmly disputed, whether any advantages are to be derived from the various efforts made at different times to divide and distinguish the innumerable and diversified forms of disease into classes, orders, genera, and species. I cannot, I will confess, set any very high value upon these endeavors at minute and particular arrangement, and we have, I think, fair and satisfactory proof of the failure of them all hitherto, in the continued multiplication of adventures on the same field. But, although no perfect system of Nosology has yet been suggested, as indeed perfection in classifying is not to be expected until our knowledge of the materials to be classed is complete, yet it would be unreasonable to overlook the learned labors of the long series of

nosological writers, who, from Plater down to Weatherhead, have been so assiduously engaged in minute researches into the history and affinities and characteristic phenomena of the widely distributed tribes of human maladies.

Each of these enquirers found it easy to detect deficiencies and errors in all the plans of all his predecessors. To avoid similar faults on his own part, it behoved him to institute a closer and more precise investigation into the nature of each individual disease, its relations to others, their resemblances and their dissimilarities. In this way, the intimate knowledge of morbid phenomena was of necessity extended and improved, and daily additions are making to the stock of facts thus accumulated.

For the benefit of the learner in all the sciences, some arrangement has been found indispensable to prevent confusion, and facilitate the attaining a clear and comprehensive view of the field which he has entered upon and is about to explore; and in this regard, the most inaccurate of systems may be of use to him.

There has been but a single exception, so far as I am aware, to the general union of sentiment, concerning the absolute necessity of some mode of pathological classification or arrangement. Rush, perhaps the most distinguished name on the records of American medicine, in contending for his singular theory of "the unity of disease," made an intemperate attack on nosology, aiming to banish and reject it altogether. He maintains, that "the different seats and degrees of morbid action should no more be multiplied into different diseases, than the numerous and different effects of heat and light upon our globe, should be multiplied into a plurality of suns."

I am not about to repeat the familiar arguments tritely urged against this singular and unaccountable error of so shrewd a thinker and careful observer. Indeed, it would appear altogether superfluous; the converse of his proposition being absolutely self-evident. The morbid actions, characteristic of the seemingly kindred affections, carbuncle and common phlegmon, though similar, are far from being identical; nor can we imagine any correspondence whatever in the nature of those which constitute small pox and tetanus. If difference in cause, in location, in history, in symptoms, and in effects, be not sufficient to

establish distinctions of essential and definite character, among diseases, such therefore as bear and require arrangement and classification, then all classification is useless and uncalled for in all the sciences. But no one will be found hardy enough to contend for so much as this.

Of the two modes or bases of nosology offered for our choice, one is deduced from a study of the discrepancies—the opposed or contrasted circumstances which go to form essential parts of the history of individual maladies; the second dwells upon the resemblances—the points of union, similarity and connection, which may exist between them; the symptoms or conditions which they may present in common, each with the other.

I am disposed to select the latter in preference for our guidance, simply because the diversities of circumstance which may be detected in the investigation of diseases, are absolutely interminable and infinite; and it would be exceedingly difficult, if not totally impossible, to draw the line between such diversities as ought to be considered important and characteristic, and such as should be looked upon as trivial and merely incidental.

That method of classification will evidently be most useful which is most obvious, simple and natural; it will be more likely to be permanent in proportion as it is unconnected with any particular theory or tissue of doctrines. It should depend on and refer to some bond of connection always present and readily observable, such as, 1. Identity of Cause; 2. Similarity of Phenomena; 3. Community of Location or Seat.

1. The etiological method, formerly popular and employed by Boerhaave and Hoffman, is now altogether abandoned, and, as it seems to me, of necessity; for, as I have already had occasion to remark, the constitutional predispositions determine the form of the morbid affections induced by a large class of exciting causes; and these are not only obscure in their nature, but are undergoing incessant change relatively to the various conditions of the individual assailed; they are, therefore, transient and uncertain.

2. The symptomatology of disease has afforded the foundation, however, for almost all the more recent efforts of the nosologists. Upon the distinctive symptoms are drawn up the tables of Sauvages, Cullen, Parr, Hosack, etc., in all which, it is easy

to indicate numerous errors and deficiencies; but the task, though not difficult, would be ungrateful and attended with no particular benefit.

Cullen, the most justly celebrated of these nosological writers, in the constitution of his plan of arrangement, was led to denominate one of his classes quite incongruously, by an appellation not referring to any regular series of symptoms, but derived from the supposed affection of a particular order of parts—a separate set of organs. I allude, as you will at once perceive, to his class *Neuroses*, in which he, and those who follow him, have comprised the disorders generally which derange or disturb the nervous system. Enlarging and extending this suggestion, Dr. J. M. Good proceeded to arrange all diseases in the same way—that is, by referring them to the systems or orders of parts in which they hold their seat or make their primary appearance; and advocated its propriety in a very full and ingenious treatise on the subject, prefatory, as it were, to his learned work entitled “*The Study of Medicine*.”

Professor Chapman, the estimable and highly venerated teacher of practice in the university of Pennsylvania, has been long governed by the same physiological method in his lectures, whether adopted anterior to the publication of Good’s nosology, I am not positively certain.

Good himself, however, fails in a consistent and proper adherence to the plan with which he sets out, and confuses himself by an occasional and indefinite reference to the distinctive symptoms, rather than the seats of diseases—as in setting apart inflammations as an order (*phlogotica*) under his third class *hæmatica*, and in placing cachexies also as another order under the same class.

Indeed, in one of the paragraphs of his preliminary dissertation, he admits the preference to be due to these distinctive signs. But granting what he is, at least, partially willing to concede, that “the symptoms of a disease constitute the disease itself,” a proposition much insisted on by Rush, and admissible enough in a practical point of view, though incorrect if considered abstractly, it by no means follows, that we are to make these bundles of symptoms our bases of arrangement. We should thus, as all experience goes to prove, involve ourselves in confusion

inextricable ; for many of these phenomena are common to an infinite number of maladies, and we shall never be able to decide which of them are characteristic, and which unessential.

To cut this Gordian knot, which I would acknowledge it impossible to untie, I resort unhesitatingly to what is called the method of physiological nosology, distinguishing the tribes of diseases according to the seats which they occupy—according to the orders of parts which they primarily and prominently affect—according to the functions which they disturb or impede.

This, although by no means faultless, seems to me so far preferable to all other known modes of classification, that I shall adopt it exclusively as the basis of the arrangement to be observed in the course of lectures in which I am here engaged, and shall go on to consider and treat of diseases in the following succession, as they prominently affect,

- I. The Circulatory or Vascular System ; including the organs of secretion and absorption, as well as of sanguineous distribution and nutrition.
- II. The Digestive System ; including the collatitious viscera, as well as those engaged directly in the solution and conversion of food.
- III. The Respiratory System ; in which, with Good, I merge the Vocal—because not separable practically.
- IV. The Sensorial System ; which coincides very nearly with the Neuroses of Cullen, Parr, etc.
- V. The Motory System ; including the whole mechanism of locomotion, as well passive as active ; muscles, bones joints, etc.
- VI. The Generative System.
- VII. The Excretory System ; under this head are comprised the affections of the cutaneous integument and the diseases of the urinary organs.

CHAPTER II.

INFLAMMATION—IRRITATION—CONGESTION.

It is scarcely possible to discuss the simplest proposition in therapeutics, without repeated allusion to that condition of disease so familiarly known under the term inflammation. Affecting, as it does, every tissue; modifying, as it may, every morbid movement in the general system; combining or concurrent, as so frequently happens, with every varied derangement either of function or structure, it is perpetually before us, demanding our attention as cause, or consequence, or coincident of almost every malady. And the same thing may be affirmed with equal truth of the general subjects of Irritation and Congestion, so nearly allied, yet so definitely separable. A brief investigation into the nature and history of these states of morbid action is, therefore, imperatively demanded of us, and must be entered into as preliminary to a due understanding of the long series of topics which are to engage us. The difficulty felt and acknowledged in all departments of human science, of making definitions at once comprehensive and accurate, is in pathology, above all other branches of knowledge, most deeply to be deplored. It ought to be made known at the very commencement of his studies to every tyro in medicine, that many of the technical phrases most frequently employed by physicians, have a conventional meaning altogether vague and unsettled. These words, congestion, irritation and inflammation, are to be read upon every page of modern pathological discussion; but they have come to be applied, each of them, to so wide a class of phenomena, as scarcely to convey the same precise meaning on any two pages, whether of the same or different writers. I need not remind you that here, as in many other instances, opposite doctrines have been founded upon these irregular and arbitrary definitions or applications of terms.

Irritation and inflammation are thus familiarly represented as identical in nature, though perhaps differing in degree; thus also by others they are hypothetically assumed to affect exclusively

separate tissues; and thus also the idea is often suggested, of their being contrasted both in mode and form. We cannot avoid, in pursuing our systematic course of enquiry into the history of disease—we cannot, I say, avoid entering within this labyrinth: let us hope that we shall not be utterly lost in its intricacies.

Irritation, of which we shall first treat, is often spoken of as excitement or stimulation, the words being used promiscuously. We meet with the phrases “normal and abnormal irritation,” “normal and abnormal excitement,” used in such manner as to imply no difference between the natural and morbid, except in mere degree. Inflammation is also spoken of as excitement or stimulation, and hence it follows from the use of this common and interchangeable language, that the careless thinker is irresistibly impressed with the idea of identity of nature and character in the several conditions referred to. To prove to you that I do not exaggerate the cloudy vagueness of the books in regard to this matter, I will give you a quotation from Sir Astley Cooper’s lectures, as reported by Tyrrell. After strongly stating to his class that they “must carefully study and clearly understand the subject of irritation, as the foundation of surgical science,” he proceeds to lay before them the following “definition of irritation,” as he is pleased to call it: “Irritation may be defined to be an altered action excited in the body by an unnatural impression.” But we cannot append a wider or more universal signification than this to the word disease; nay, we would hardly make it quite so wide, for it does not appear that all altered or unnatural actions are of necessity diseased.

As the first step in our researches, let us first endeavor to ascertain what irritation is not, and simplify our task by distinguishing it in its essential characteristics from all accidental or incidental complications.

1st. Irritation does not consist merely in “altered action.” In all diseases altered action—change of structure or composition, or change in the performance of function, whether dependent upon or independent of change of structure—must be the incipient condition. But no one will venture to affirm this universality of irritation. Sedation under certain circumstances, fairly implies the absence or defect of impression, of excitement, of irritation. In many instances of leipothymia or syncope, there

is no evidence, nor as far as I am aware, any suspicion of an existing irritation or cause of irritation. In death from protracted and intense cold, we have "altered action from unnatural impression;" but what mode of irritation is here? Is there anything more appropaiate in the example chosen by Sir Astley, of death from a sudden and severe blow on the pit of the stomach, or in poisoning by prussic acid!

2d. Nor does irritation consist in stimulation, hyperexcitation, increased vascular action. As this is the prevailing doctrine of the day, it may require a closer examination. It would be well if those who maintained the affirmative of this question, would instruct us in the exact meaning which they are desirous to attach to the words "excitement and stimulation." While some hold irritation to be identical with inflammation, and consider the expressions, stimulation and excitement, synonymous with both, others draw a line between the two first, regarding irritation however as a necessary antecedent, or indeed an essential element of inflammation.

It is easy to prove the error of the first of these notions. The eye may be irritated intolerably by the admission of a strong glare of light upon it; the ear by a harsh discord or loud sound, as of a drum or gong too near; the teeth set on edge by the grating of a saw or file. Inflammation is not present in any of these cases;—nor in the tickling which urges irresistibly into convulsive laughter; nor in the cough produced by the admission of an atom of water or dust into the rima glottidis. But irritation is in so many instances an antecedent of inflammation, that their necessary connection was matter of ready and plausible inference. We shall however find them, upon a careful analysis, to be fairly separable. Irritation, as the very term seems to imply and as we shall endeavor to show, marks its presence by prompt and obvious phenomena, and cannot exist without making itself felt and seen. The results of inflammation often exhibit themselves, on the other hand, unexpectedly, and are developed insidiously. Tubercles occasionally enlarge, mature and break down without any notable disturbance referable locally. Thus also in certain cases of rachitis and marasmus, and of ramollissement of the brain and spinal marrow with fatuity and paralysis, we have the alleged results of inflammation occasion-

ally exhibited, without our having been in any way made aware of the progress of the morbid changes.

Not to dwell upon the doubtful instances of spontaneous gangrene, and the equally doubtful history of dropsies and other effusions, which may or may not be the result of previous obscure inflammation of a part or parts, we find many tissues, characterized as destitute of irritability in the healthy state, capable of vehement inflammation; such as tendons and bones, in which irritability and irritation seem indeed to be generated by inflammation, instead of being its cause or antecedent.

Nor is there any thing in the nature of irritation which so connects it with inflammation that the latter shall of necessity ensue, either from the intensity or protraction of the former. There must be an intensely severe degree of irritation affecting the universal system in trismus nascentium, and in traumatic tetanus; yet in neither of these examples can we demonstrate the presence of inflammation of any part or tissue. A wound inflicted may have healed perfectly; nay, it is supposed by a majority to diminish, and is not imagined by any to increase the danger of fatal and irritative spasm, if we keep up or renew the inflammation of the wound by stimulants. Hydrophobia, that most obscure and mortal malady, offers us another remarkable instance of intense and protracted irritation unproductive of any notable inflammation, and connected, as far as is observable, with spasm only. Of sympathetic irritations uncomplicated with any supposed inflammatory tendencies, farther instances may be adduced in great numbers. Galvanism, which will arouse even a recently dead body into contortions frightful to look at, agitates uncontrollably the living subject. *Nux vomica* and other drugs excite spasmodic muscular motions by their specific influences. The heart may be urged into convulsive action by mental emotion, on the one hand, and on the other, by the efficiency of known physical agents. Now all these impress directly, or are reasonably supposed to act upon that principle which in discussions concerning animal life we call irritability, and this alone.

What then, is irritation? It is not merely altered action, which even when somewhat irregular, may or may not be morbid or diseased; for nature surely does not so strictly limit her-

self to mathematical lines of action, as to admit of no variety of condition without morbid derangement. Indeed such variety, such changes of condition, moderate in degree and transient in duration, of function certainly, if not of composition or structure, seem to me not only consistent with, but actually conducive to the most vigorous and luxuriant enjoyment of health; as the slighter discords are interposed by the most skilful composers in music to heighten the effect of the most perfect and glorious harmonies.

Nor does it consist in what is vaguely spoken of as excitement or stimulation; though I have already admitted that it seems to be more nearly allied to this condition of a part or of the whole system than to the opposite state of debility or sedation. With such depressed action, we find that inflammation more readily connects itself, or more properly exhibits itself in what we regard as its peculiar results.

Irritability, the *vis insita* of Haller, is a property existing perhaps, in all the tissues of a living body, though in very different degrees. Its intimate nature is unknown, but I do not hesitate to consider it a mere modification of that excitability which is the exclusive and essential characteristic of life, and which distinguishes indeed a living from a dead body. It feels in the nerve; it contracts in the muscle; it renders each portion of every organ susceptible of the impression destined to awaken it to its own peculiar action or function. This, it is readily perceived is its physiological history. But it is also susceptible of the influence of hostile or injurious agents, and when thus impressed, urges to morbid and destructive action the several parts affected. The nerve tingles with horrid pain; the muscle refuses to obey the control of the will, but contracts irregularly and forcibly—with spasm, which when it interferes with the constant and uniform play of certain vital organs puts an end to life at once; as when the heart and diaphragm contract spasmodically. The irritability of other tissues is comparatively obscure; the irritability of nerve and muscle is obviously unequivocal. Pain then, and that mode of muscular contraction which we call spasm, are the direct effects of irritation properly so called, and emphatically. There is no necessary connection between them; they do not always occur together. A nerve, as

in tooth ache, and perhaps in some other forms of neuralgia, may be violently irritated without disturbing any single fibre capable of contraction. A muscle or many muscles, or only a portion of a muscle, may, as you have all doubtless seen, be irritated into spasm, shown by irregular and involuntary contractions, without pain; as in hiccup, cough, etc., where the morbid impressions seem to have affected directly the muscular fibre itself.

Parts are usually irritable in proportion, as the phrase is, to the intensity of their vitality, which is also pretty regularly proportioned to the supply of nervous influence which they receive, or to their contractility.

An abundant influx of red blood was supposed to be necessary to the full development of this quality or property; but the eye and all its parts are exceedingly irritable, though nourished with colorless blood. Red blood is found in some of the colorless tissues when inflamed, as in ligaments, tendons, fascia; and these appear to be thus imbued with new modes of vitality, becoming both irritable apparently, and highly sensitive.

There are certain modes of irritation which seem to lie upon the doubtful line which separates physiological from pathological actions. I have had occasion to allude to the tickling which produces inextinguishable laughter and irrepressible contortions of the body—to cough, whose purpose or final cause is the expulsion of some irritant from the respiratory cavities—and to hiccup, a singular and unaccountable movement of involuntary and sudden contraction of the diaphragm, usually the result of some obscure disturbance of the stomach. Sobbing and sneezing are equally involuntary, and seem to involve, though in a very dissimilar manner, the whole series of muscles engaged in respiration. The use of the former, which almost exclusively attends upon the depressing mental emotions, we do not know. The latter removes annoyances acting on the schneiderian membrane. All the mucous surfaces seem notably irritable, being highly vitalized by innervation. The various modes of irritation which affect them, are among the most important and extensive sources of constitutional derangement. We know not clearly how the sympathetic impressions are diffused, nor what determines the direction they shall take, but we know that they

are subject to great diversity. The stomach or the duodenum, the ileum or the colon being disturbed by an irritant, we may have gastritis or enteritis from inflammatory excitement of the tissue disordered; or we may have the secretory vessels urged to undue and unnatural action, and made to pour out mucus and pus, as in diarrhœa and dysentery—or abundant serum, as in cholera—or the muscular coat shall be thrown into undue and irregular contraction checking the peristaltic motions, as in colic and constipation—or even by some strange perversity of influence reversing the movements, as in iliac passion with stercoreaceous vomiting.

Serous membranes, though quite as ready to take on the inflammatory condition, are by no means so irritable. They are probably somewhat less highly vitalized, as they can scarcely be said to be directly engaged in the performance of any one of the more important functions of the economy. Yet these membranes, like other colorless tissues, pass when inflamed, into a state of intensely augmented susceptibility and sensibility, suffering extreme pain and sympathetically radiating violent disease. Here it is obvious that inflammation is not only antecedent to irritation, but that it actually developes irritability.

This is one of the numerous and familiar examples of the immediate connection and consent of action, which so generally obtains between the nervous and vascular tissues of the body; tissues which, though not the exclusive seats of vitality or the vital properties, are doubtless the exclusive media through which all other tissues are vitalized originally, and continue to enjoy life. That the connection is reciprocal as well as close and tenacious, is easily shown. Pain and spasm may be, as we have seen, excited by inflammation; on the other hand, secretion is among the prompt and immediate effects of irritation, as in the quick flow of tears from a hurt eye, and of mucus from the mouth under the influence of temperature or sapid substances. Many of these actions, wherever commencing, are diffused either slowly or rapidly by sympathy; at least this is the received doctrine, though I surely need not remind you how vague and inconclusive is all the knowledge we possess of the *modus operandi* of this mighty power, through which, it is not too much to affirm, almost all the vital processes are influenced perpetually

and impressed for good or for evil, happily or to our injury. The central portion of the nervous system, the brain, being disturbed by mental emotion, the heart palpitates or throbs convulsively, and the cheek blushes or grows pale. So also if we apply friction or percussion to a sensible part, or excite pain locally, the vessels of that part will admit and become distended by red blood, and if a secreting organ or surface, its secretions are promptly increased or deranged.

Should we essay to divide and distinguish diseased conditions under the three heads of irritation, sedation and inflammation, the first might, I think, be shewn to comprise three-fifths or more of the whole range of morbid phenomena.

In the perusal of the valuable writings of Travers, among others, you will find almost all the circumstances of prostration, mere exhaustion, sedation proper, described and dwelt on as symptoms and direct proofs and results of irritation. If again you turn to the works of Broussais and his followers, you will meet with a perfect amalgamation of the irritative and inflammatory states, and an unhesitating ascription of all the results of both indiscriminately to either. In other words, Travers recognizes a distinction between irritation and inflammation, attributing the phenomena of the first to disturbance chiefly, as he expresses it, of the nervous system, and those of the latter to mere vascular derangement.

Broussais, on the other hand, regards both irritation and inflammation as mere conditions of hyperexcitement of the vital properties of the part or tissue. With much inconsistency they agree in accounting for the symptoms of sedation, by referring them to irritation as their cause, thus departing from the more original and consistent views of Brown, whom Broussais has in all his writings mercilessly plundered without acknowledgment. Brown, you are aware, divides all disease under the contrasted heads of *sthenia* and *asthenia*—increased and diminished excitement—sedation and inflammation, which latter is, in his view, nothing more than an intense vascular action; irritation considered as an affection of the nervous or sensorial function or tissue thus being allowed no place in his simple and intelligible system.

The causes of irritation are infinitely numerous, and as diversified in their nature as the susceptibilities of the organs and

tissues which they are adapted to impress. We may separate them into two classes, designating them according to their mode of operation as direct and indirect. The first will include all those which, when applied to any part, produce in it a morbid sensation or contraction—I say morbid, for we are discussing the subject pathologically, not physiologically.

Almost all medicines may be enumerated under this head, and a majority of poisons emphatically so called. Mechanical injuries, chemical corrosives, electricity and galvanism, are also properly arranged here. The indirect causes of irritation are such as affect parts at a distance from the locality to which they are applied, whether revulsively or sympathetically. Examples of the first kind, may be multiplied indefinitely. Of the latter, we are furnished with striking illustrations in tetanus, from a slight wound healing promptly—in the rigid spasm and convulsions following the introduction of some poisons, as strychnia into the stomach, and the presence of worms in the intestines, and in the hideous train of consequences attending inoculation with the saliva of a hydrophobic animal.

Broussais specifies four causes of irritation :

1st. Excessive excitement by certain agents called stimulants or irritants—directly applied.

2nd. Sympathy with another irritated organ.

3rd. The absence of a stimulus which is habitual to the part; and,

4th. Repulsion of excitability from other parts.

In the first specification, he reasons in a vicious circle. He assumes, that irritation is excessive excitement. Then it follows, that agents directly producing it are excitants, stimulants, irritants. Or, he assumes, that such agents are excitants, stimulants, irritants; and then it follows, that their effects must be excitement, stimulation, irritation.

Now, some of the agents capable of arousing vehement irritation are not proved to be stimulants in any received sense. Who would call the poison of a hydrophobic animal a stimulant—or the venom of a rattle-snake, or datura stramonium, or strychnia? They certainly cannot be regarded as stimulants in the same mode as phosphorus or alcohol or æther.

In the second, he takes for granted, the essential necessity of

some local affection. This I acknowledge to be highly probable, but cannot consider it as yet to be fully proved.

To his third I object, because of its obvious incongruity with his first. If the presence (or application) of any agent be stimulant, how can its absence (or removal) be also and alike stimulant? Such removal may be a mode of impression, I admit; but this cannot be precisely of the same nature with its continued presence. The sudden silence of a public speaker is impressive, and will often arouse promptly those who have been lulled to sleep by his discourse. It should be recollected, that Broussais confounds all modes of impression under the wide character of stimulant or exciting, which, he says, is irritation.

His fourth, if I understand, I deny to be possible. Excitability is a property or quality. He is justly chargeable with ontology, (a heresy which he spent his life in denouncing,) when he treats of it as a matter or substance to be moved hither and thither—repelled, attracted. It may be destroyed or diminished—enhanced or heightened in any part; but I cannot conceive of its repulsion or attraction from any one locality to any other.

The phenomena of irritation, whether produced directly or indirectly by its causes, may be arranged under five general heads—1st. Pain; 2nd. Spasm; 3rd. Secretion; 4th. Congestion; 5th. Inflammation. Speaking with logical accuracy, the two first only are to be regarded as symptoms essentially denoting its presence. The three latter may be properly considered as its effects, arising not uniformly, but under varied contingencies of protraction, locality affected, etc. It is a nice distinction, however, which in any pathological investigation proposes to separate mere symptoms from effects or ultimate results of morbid action.

1st. Pain in the part, is the most general of the symptoms of irritation. The nature of this morbid sensation is not clearly understood, nor will it be, until we have succeeded in attaining some definite knowledge of the nature of sensation in general. Suffice it to say, that all agents which impress the nerves in a manner unadapted to their original and natural susceptibilities, tend to give pain. Agents best adapted to these susceptibilities, also give pain instead of pleasure, when their application is too long continued, or their force or concentration too great. The

final cause of this effect is easier to be understood than the mode in which it is brought about. Like satiety when our natural appetites are gratified, it is intended to protect from wasting indulgence, and the disproportioned employment of organs.

2nd. Spasm constitutes a formidable condition of disease. As pain is for the most part, though with exceptions, a direct effect of an applied irritant, so spasm is very generally an indirect or sympathetic consequence of some morbid impression. It is unnecessary to repeat here the acknowledgment of our inability to trace the several links which connect the original lesion with the series of morbid effects arising, and transferred or diffused. A puncture of any extreme point of the cutaneous surface, the fracture of a bone, the extraction of a tooth—any wound whatever; nay, a blow which has produced no wound or abrasion, may give rise to trismus and tetanus. The convulsions of hysteria and epilepsy are among the most obscure of all morbid phenomena, depending on causes of irritation so transient that their impression seems to pass away in a few minutes—so little within the reach of our investigations as to remain undetected by the most careful scrutiny, yet so tenacious, as to protract their recurrent influence throughout a long life, and so vehement as not rarely to put an end to life itself. Dentition, a process natural and unavoidable, is often the efficient cause of violent and fatal convulsions. So is mental emotion of varied character; and there are several poisons which give rise to rigid spasm of horrid aspect.

3rd. Secretion is, in certain tissues, affected promptly by the causes of irritation. Annoy the eye with too much light, and tears flow profusely from the lachrymal gland. So, if we apply a rapid, or pungent, or acrid substance to the tongue, the mucus of the mouth and salivary glands gushes forth abundantly. That this rapid secretion is usually given out from the vessels under the sympathetic excitement of their nerves—intense “innervation,” as some phrase it, I will not deny, but I conceive that this is not the essential or exclusive mode. The immediate efficiency of certain agents seems to me directed at once upon the secretory surface and vessels. It is not true, that those acids most sensibly felt by the delicate nerves of the tongue bring on the greatest mucous discharge from the mouth. Many things

increase the quantity and alter the composition or quality of the intestinal secretions and excretions without affecting notably the sensibility of their extensive mucous surface. The secretions of all irritated parts are apt to become vitiated and assume morbid qualities, although there may be no apparent change in the structure or permanent condition of the parts. The results differing with the modes of action upon which they depend, develop specific and characteristic peculiarities in many known cases. The saliva of a hydrophobic animal thus becomes virulently, nay, fatally poisonous; and you will find cases related by authors of high estimation, in which analogous qualities were exhibited in the saliva of men provoked to vehement and malicious rage, whose bite proved mortal.

4th. Congestion. It is an old maxim in pathology, though perhaps admitting of some dispute whether it be correctly true as the statement of an uniform fact—"ubi irritatio ibi fluxus"—that determination of blood ensues necessarily upon irritation of any part.

Prick with a needle any point of the skin, lay for an instant the finest hair upon the surface of the eye, let a drop of vinegar fall on the tongue, the smaller vessels immediately near become promptly distended with red blood, which their natural elasticity enables them to get rid of more or less readily, either by ordinary circulation, or by secretion or effusion. This is one of the modes of congestion, which may be termed active, as implying a spontaneous dilatation of the vessels themselves by their own local independent vital action, under an impression directed upon their nerves or the nervous filaments in their immediate vicinity.

The passive form of congestion seems to be unconnected with any local irritation whatever; resulting as far as we can explain it, sympathetically or revulsively from influences applied and acting upon remote organs and tissues. In ague, the cold stage of fever, under long protracted exposure to cold, and in many instances of what we call collapse, a cutaneous capillary paralysis, the fluids desert the external surface, and must be collected in the vessels of the internal organs and tissues. The spleen especially and most frequently, but the brain also, the liver and the lung, may be thus engorged with blood. Hence arise hemorrhages, hypertrophies analogous and heterologous, indura-

tions, various degeneracies, and among the most familiar consequences inflammation—a subject which we now proceed to discuss in detail.

5th. Among the symptoms, phenomena, effects of irritation, the last which I enumerated above was inflammation. Though certainly separate and distinct conditions, they are often connected. Each of them may, as I have shown, give rise to the other, their mutual reaction giving additional intensity to both.

The changes which constitute inflammation have been made to undergo the closest, most rigid and attentive examination. The observers differ from each other somewhat, both in regard to the alleged facts and the succession in which they present themselves. The minutest order of vessels, which we denominate capillary, has been most patiently watched, and with the most powerful microscopes, in order to detect the character and course of inflammatory movements excited for the purpose of experiment. The whole history of this capillary system must be confessed to be still, as in the days of Bichat, veiled in the most impenetrable obscurity. Dr. Marshall Hall describes the capillaries as a net-work of pellucid vessels differing from small arteries in this, that they subdivide without becoming smaller, and anastomose very freely. Forming an intermediate communication between arteries and veins, he regards them as rather passive than active canals, through which the blood is circulated by the *vis a tergo*, the impulse of the heart and larger arteries, the absorbing action of the veins, and capillary attraction. Crawford and others attribute an active circulating power to the capillaries as well as to the small arteries, and Parry denies all such power to both sets of vessels. Now, while our knowledge of the natural and healthy functions of this portion of the vascular system is so vague and unsettled, we cannot hope to ascertain clearly their diseased operations. During the several stages of the reported experiments upon the transparent parts of animals, the foot of the frog, the ear of the rabbit, etc., the most contrasted phenomena offer themselves to view. At one moment the parts are pale, at another red; at one moment the fluids pass rapidly along the vessels, at another they seem almost stagnant. How shall we decide when inflammation has begun; how determine the cause of the retarded, and the cause of the

accelerated circulation? Kaltenbrunner, and after him Crawford, pretend to lay down nice and definite lines of distinction. They arrange the morbid changes under three periods, to which they affix the following titles and description:—1. A period of incubation, of which they themselves remark, “that it is variable in its signs and duration.” 2. A period of congestion which they subdivide into two periods, the first characterized “by an increased activity of the vessels, and influx of blood”—the second “by a labored slow circulation, arising from over distention of the vessels and increased thickness and viscosity of the blood.” 3. The period of inflammation—“Now the circulation is completely interrupted; the blood coagulates, clogs the vessels and stagnates in several points of the inflamed part, etc., etc.” Crawford farther declares that “Congestion and inflammation pass so gradually into each other, that they are always necessarily combined; and it may often be extremely difficult to draw a line of demarcation between them.”

The obvious truth in the above statement seems to me to be this; that the congestion, both active and passive, of what they designate as the second period, and the complete interruption to circulation in the third, are mere consequences or results of the undefined changes of action and condition which have occurred during what they are pleased to call the stage or period of incubation; these earlier elements in the connected series of phenomenon being confessedly too obscure and variable to allow of description.

We are to inquire farther, however, whether the steps above detailed are all of them uniformly present and essential in the production of the results noted; if not all, which of them must be considered as thus essential?

Irritation and congestion are usual antecedents, and doubtless are among the frequent causes of inflammation, but are they necessary to its development? I confess myself somewhat uncertain as to the powers and capacities of the capillary system, properly so called. I know not whether the vis a tergo from the heart, or its suction force exerted on the venous blood can affect fluids in tubes so minute, whose sides are at the same time so compressible and so liable to compression; nor whether capillary attraction can act in such tubes while full in all their

extent. But I do not doubt the action and independent powers of the smaller order of arteries. They dilate spontaneously and notably in blushing, and when subjected to heat and cold, friction and percussion. In these examples we cannot refer to any influence upon the heart exerted by the causes of cutaneous redness enumerated, nor to any special action of the heart upon the vessels distended. We cannot imagine the central organ to be endowed with any elective propensity, by which it is led to distribute an undue quantity of blood to the surfaces specified; and we cannot avoid the conclusion that the local changes are developed by the spontaneous action of the vessels affected.

Nor am I clearly satisfied with the attempt to make out a capillary system entirely separate and distinct from the veins and arteries on either hand. I am rather disposed to believe that those vessels become capillary in their distribution, retaining their peculiar structure and functional capacities.

Andral, one of the greatest names of which modern medicine can boast, dwells upon the extreme difficulty of properly comprehending the subject of inflammation, and proposes to lessen this difficulty and to remedy the confusion which has embarrassed the inquiry, by a total abandonment of the word. He contends that it has been employed to express too wide a meaning, and urges the study of its elements separately and progressively. Yet he classes inflammations and congestions together under one head, fixing the attention emphatically or exclusively upon the single condition of hyperæmia—excessive presence of blood in the part. When such accumulation of blood is due to increased action, this constitutes active hyperæmia, including all active congestions and inflammations; when from debility or obstruction, it is called passive hyperæmia, and comprehends passive congestions. It happens unfortunately, however, that the circumstance or contingency which he regards as the most uniform constituent of inflammation, is considered on the one hand by Crawford as an antecedent rather than an element of that morbid state, and by others, not unreasonably a consequence more properly than either a part or cause of the disorder. Both these statements may be founded in truth, though neither may be exclusively or precisely correct. The determination of blood to an organ must be the result of the

local condition of the structure implicated. Now, if this altered condition be not inflammation, what is it? Irritation does not always produce hyperæmia; the rule *ubi irritatio ibi fluxus*, if uniformly true, would only prove irritation upon Andral's principle to be identical with inflammation, a dogma which I have already combatted, I hope not in vain, but would not aid us in our present investigation. For if irritation be the cause of the fluxus or determination, it must precede it. Inflammation then, being merely another word used to indicate the cause, cannot surely express properly the effect. Besides this, hyperæmia is a common symptom of many conditions, both healthy and diseased. It is present in blushing; in venereal and other physiological modes of excitement, as in weeping and in the flush of anger and of joy; in both passive and active congestions; in hypertrophies, some at least of which may be regarded as distinguishable both from congestion and inflammation; and in the uterus just before menstruation and during pregnancy.

You will at once perceive that I am not prepared to give an unqualified assent to any one of the numerous theories of inflammation. Let us for a moment reflect upon the difficulty of constructing any hypothesis which shall explain or consist with all the observed facts, as they are not only differently described by the authorities, but acknowledged by all to vary during the several stages of the process. The circulation is at one time slower, at another more rapid! What state of the affected vessels will account for these opposite conditions? If we attribute the afflux of blood to spontaneous dilatation of the vessels, (as Hunter did,) we shall find it difficult to explain the slowness and ultimate stagnation of the blood described by the microscopic observers, in arteries and veins, whose powers of action are heightened, and whose functions performed with greater vigor. If, on the contrary, we regard the vessels (with Thomson,) as weakened and debilitated, we shall be embarrassed to account for the accelerated circulation of the early periods, the lively sensibility, the florid redness so quickly restored after the surface has been made pale by pressure. Thomson affirms the velocity of the blood to be sometimes increased and sometimes diminished; what common vascular condition may serve as the cause of these contrasted states? Parry refers all the symptoms

to an increased momentum of the blood in the part affected; but this he does not ascribe to any satisfactory cause, and has thus removed the difficulty but one step back.

For my own part, I consider every theory insufficient in its own nature, and untenable, which shall proceed upon the supposition of a mere increase or abatement, enhancement or diminution, of action, excitement, power.

Inflammation is a condition essentially morbid, not in degree only, but in its very nature; and this is made equally clear, whether we refer to its consequences, its symptoms or its causes. These causes infinitely varied as they are, not only affect the force or intensity of action in the part which they impress, but go mainly to determine the mode which that action shall assume, and the results which it shall produce; an influence which is exerted as well by the exciting, occasional or accidental causes, in many instances, as it is in all by the predisposing or constitutional.

In the mean while, the normal or physiological actions are suppressed, subverted and substituted by the new and diseased actions, and these may be either more or less forcible than the former. Inflammation, like fever, may be either sthenic or asthenic; an alternative probably determined by the state of the system at the time, which may be either entonic or atonic. Less frequently perhaps it may take a local character, from the nature of a cause locally applied.

The condition of the blood in inflammation deserves attention here, as it has been supposed to throw some light upon the obscurities of this dark subject. "Not long since," says Andral in his *Hæmatology*, "Meckel defined inflammation to be congestion, with a tendency to new production." "The study of the blood," proceeds Andral, "shows the justness of this definition. For what else than a new production is the excess of fibrine which suddenly appears in the blood of a person attacked with pneumonia or erysipelas," etc. This excess of fibrine to which he ascribes the buffy coat of the blood and many of the phenomena of inflammation—is it the cause or the effect of this condition? It is "the least variable sign"—yet still not invariable; for the same authority goes on to say, "except when it occurs in anæmia, this production uniformly denotes inflammation."

Meckel's definition is farther liable to the obvious objection, that many new productions are by no means made out to be inflammatory, though they imply determination to a part, which is, I suppose, what he means here by "congestion." We cannot class all hypertrophies under this head; many tumors are indolent; tubercle itself seems to be deposited, as is shown elsewhere, independently of any essential connection with inflammation.

I have insisted upon the essentially morbid nature of inflammation. In surgery, however, it has not been uncommon to recognize a distinction of inflammation into "healthy" and "diseased"—the latter being intended to comprise the several modes which are termed specific and malignant. John Hunter was disposed to regard inflammation as the older physicians looked upon fever, as a salutary struggle or effort on the part of the *vis medicatrix naturæ*, to effect some useful purpose in the animal economy. Modern surgeons limit this favorable view of the matter to what they call adhesive inflammation, and speak of this as a natural and healthy process. To this you know they ascribe the healing of wounds, and the success of numerous and highly useful operations. The first of these alleged effects deserves a moment's attention. The prompt healing of an incised wound, I do not believe to be dependent upon or produced by any mode of inflammation. The opposite surfaces of such a wound unite, because their open vessels being brought into close apposition, the circulation is allowed to go on very nearly as before, and the functions of the nutrient arteries are performed in the ordinary manner; the material proper for the restoration of the integrity of the disunited tissue or structure being deposited. The less the part is injured, the less it is inflamed, and the sooner healing and restoration take place. The greater the violence done, the higher the inflammation, the slower the process of healing. Restoration then being quick or slow, in inverse proportion to the degree of inflammation, it is clear that the latter retards rather than promotes it. When an artery is constricted by a ligature the inner coat is cut or broken across and the vessels of the divided surface, the *vasa vasorum* brought into forced apposition, effect a permanent union by the deposition of the nutritious matter of that tissue.

The skin of the forehead dissected and turned down and pro-

perly shaped, supplies by its union with the skin of the cheeks in the taliacotian operation, the place of a nose. It is well known that parts which have been entirely and for some time severed, will reunite in their old connections. A piece of skin has been pared off from the finger, and on careful replacement has become perfectly re-attached. An entire finger has been accidentally amputated, and after an interval of many minutes, being recovered and replaced, adhered firmly. Dr. Carlizze, in the *Osservatore Medico*, an Italian journal, gives us a very curious case of this reunion. "The patient, a woman of the town, had the whole of the soft part of the nose bitten off by a man, in a quarrel. She was carried before the commissary of police, and the wound was dressed. Three hours afterwards, Dr. C. coming in, saw her, and entreated that search should be made for the lost nose, which was found two hours and a half later, contracted and covered with filth. The parts were then washed and the piece carefully applied with a few sutures. The dressing being removed on the seventh day, complete reunion had taken place. The tip of the nose was at first livid, but being washed over with a strong solution of nit: argent: a superficial eschar separated, and the organ resumed its natural appearance."

Nay, parts of other animals, as in Hunter's and Duhamel's experiments, may be made on the same principal to adhere in new and unnatural positions. Among these, a tooth recently extracted from a man's jaw, being set in the comb of a cock, adhered and was firmly fixed there; the testicles of the male bird were removed into the body of the female, etc. etc. It is no doubt by the same mode of adhesion that grafting and inoculation, so often practised by gardeners, connect the parts of different plants. Now if we reflect on the class of cases last referred to, we shall perceive that union must take place independently of any possible inflammation, because a severed piece of skin or flesh,—an extracted tooth, etc., must be incapable of any vital process until reunited; the reunion then being of necessity antecedent to inflammation cannot be its result.

It is far from being my purpose to deny that adhesion is often a consequence of inflammation, or to detract in any degree from the merit of modern surgeons in moulding this effect most ingeniously and beneficially. The deposition of lymph or fibrine

is one of the most ordinary attendants upon inflammation. In phlegmon, it limits and circumscribes the effusion of pus; in pleurisy, prevents perhaps the condensation of the lung under the pressure of serous secretion, by uniting the costal and pulmonary surfaces of its investing membrane; in like manner, effects the radical cure of hydrocele; and sometimes, by lateral union of intestinal folds, enables us to relieve the sufferer from the intolerable grievance of artificial anus. These are incidental contingencies, and when made subservient to its purposes, deserve to be regarded as proud triumphs of the art of healing. So, by the use of corrosives and caustics, even sloughing and mortification are rendered available and advantageous. But nothing can be more illogical than to infer thus from salutary results ultimately attained, a salubrious nature or character as belonging to any given process or condition. Almost all therapeutics consist, as I have argued, in the substitution of one evil for another—the less for the greater; in the excitement of one form of disease to expel or unseat another; the employment of revulsives more or less annoying and injurious; the administration of poisons to procure their emetic, or purgative, or stimulant, or alterative action. It is worthy of remark, that re-production or restoration of lost parts, is never perfectly identical or homogeneous; the fibrine or lymph deposited, when inflammation—adhesive inflammation has supervened, never assumes the precise structure, or is capable of the physiological offices of the lost portion of original tissue.

An eschar or cicatrix is always distinguishable from the natural and beautiful integument, and is bald; the adipose tissue and the bone lose their symmetrical cellular arrangement, and divided muscle is repaired by a ligamentous band. Some affirm, the complete reproduction of nerve when extirpated; if so, which is not yet fully established, it is the sole exception to the rule.

I am unwilling to admit the correctness of the distinction so commonly received, and indeed now made part of our ordinary technical language, between acute and chronic inflammations. The essential history of each is the same; the successive changes the same; the ultimate results or consequences the same. It seems unscientific, then, if not idle, to attempt the establishment of any pathological distinction upon the mere difference of

time occupied by the several steps of the processes gone through. The symptoms of inflammation you are all familiar with. "*Notæ veræ inflammationis*," says Celsus, "*sunt quatuor; rubor et tumor, cum calore et dolore*,"—pain, swelling, heat, and redness, to which is sometimes added throbbing. The increased heat of an inflamed part has been the subject of much dispute. As we do not clearly understand the physiological generation of animal heat, we cannot always explain why the part diseased seems so unnaturally hot, for there is rarely wanting either in external or internal inflammations a positive sense of increased heat. Hunter seems unwilling to allow that it ever rises much above the natural temperature of the trunk of the body, or the central heat, which he supposes to be at or about 98° Fahrenheit. He did not meet with it, he says, above 101 or 104. Crawford and others, have seen it as high as 106 and 107, and, in scarlatina, it is affirmed to have reached 112. I would ascribe it to the increased activity of circulation, and the greater quantity of blood sent to the inflamed part. It seems partly to depend both here and in fever, upon the suppression or obstruction of the secretions and excretions—the sensible and insensible perspiration, etc. Liebig attributes it chemically to the transformations of tissue, which give out so much caloric previously latent. But we have numerous and striking examples of analogous rise of temperature independent of inflammation or any known changes or transformations; as in the burning blushes of the modest or guilty cheek, the heat of the genitals under venereal excitement, and that of the vagina during parturition, which, according to Granville, has been found as high as 120 Fahrenheit. Pain as a symptom of inflammation, is generally declared to depend upon the nervous irritation present; but the exact mode of this irritation is not pointed out. The tension occasioned by the afflux of fluids, and the consequent swelling, must undoubtedly increase very much, if indeed it does not give rise to this pain, which is said to be often proportioned inversely to the extent of the swelling, being apt to be most severe in structures which do not readily admit of distention. We can hardly, however, go far wrong in attributing pain to the occasion of any new, unaccustomed or unnatural condition of any part, or change in the state of an organ, especially if such change be great and sudden.

Thus, we observe in what are called chronic inflammations, which proceed slowly, often resulting ultimately in marked alterations of condition and structure, that little or no pain is complained of, as in some cases of psoas abscess, spinal disease, and the insidious forms of phthisis.

The redness depends obviously upon the dilatation of the smaller vessels, and the admission of perfect red blood in undue quantity and into tubes not previously adapted to the reception of the globules and colouring matter, as the whole conjunctiva is injected in ophthalmia. Thus, also, we account for the throbbing which may occur; unusual pulsations are felt in arteries now for the first time enlarged sufficiently to receive the current of blood propelled directly by the systolic impulse of the heart. Formerly capillary, they admitted only serum or colourless lymph, or rather, perhaps, absorbed and transmitted it in a steady current without pulsation. The throbbing, however violent locally, is always synchronous with the pulse.

Spasm, and consequent obstruction and constriction of the vessels; error loci of the parts of the blood; lentor and inspissation of that fluid, have been pointed out by different theorists as proximate causes of inflammation. It will not be denied, that they are very generally, if not uniformly, present as attendant or coincident circumstances. Nothing seems more likely than that vessels thus irritated and disordered will become irregular in their action—spasmodically and convulsively, to use a phrase of Rush applied to fevers. Obstruction is, probably, among the train of ultimate results, though, in the early stages, the veins are seen unusually filled with the fluid they are rapidly carrying away. The dilatation or distention of the smallest order of vessels may be such as not to admit of the easy passage of such unaccustomed parts of the blood as now find entrance into them. An analogous error loci of the red globules obtains frequently, however, in a transient way, when there follows no obstruction, as under friction, in exercise, in weeping, and a variety of mental emotions. Lentor and inspissation of the blood are inferred not only from the above causes and conditions of probable obstruction, but also from certain changes occasionally taking place in the fluid itself, of which buffiness is the most frequently met with and most dwelt on.

After what was formerly said on this subject, it will suffice here merely to remind you, that we find the buffy coat very often in pregnancy, and under other contingencies apart from inflammation, and that it is not invariably met with in the unequivocal phlegmasiæ. With regard to the alleged uniformity of lentor, W. Philip, Hastings and Thomson, all agree that the velocity of capillary circulation is, in some cases, positively increased. The obstruction of circulation, dark redness, and swelling, observed in the advanced stages of inflammation, are owing not merely to the state of vascular action in the part, but to anatomical and mechanical changes in its condition. There is morbid effusion or deposition very often, with rupture of minute vessels and transudation of dark blood and coagulable lymph. The pain, which has been intense, now declines or subsides; the vital susceptibilities at first heightened, (at least, in moderate attacks,) exhibited an augmented sensibility; hence, the patient complained unduly of the increased heat and the throbbing. This enhancement of sensibility and intensity of suffering are, in general, directly proportioned to the original sensitiveness of the part affected, though this rule is not without exceptions, of which the joints and ligaments, unfeeling and inirritable in their natural state, and exceedingly painful when inflamed, are examples. After a certain duration of the inflamed state, or a certain process of change in the condition of the part, this morbid tenderness usually diminishes.

In discussing farther the history of inflammation, we are led to observe that its effects, results, consequences, or (as surgeons phrase it,) terminations, are exceedingly various, and exhibit many modifications. These depend in a notable degree—1st, Upon the texture or organic structure of the part affected; and 2nd, Upon the nature and peculiar influences of the cause efficient in producing the attack. I cannot agree with those who regard hypertrophy of any organ or portion of the body among the effects of inflammation. It is not easy to account for obesity and other analogous hypertrophies, which become virtually diseases by the inconveniences which they sometimes occasion, and may even prove fatal by mechanical obstruction and impediments to the performance of functions. Heterologous hypertrophies, which consist in the deposition of new and unadapted atoms in

unnatural connections, may indeed be the result of inflammation ; but even this is not essential. Atrophy, on the other hand, is a very frequent consequence of inflammatory disease ; the nutrient vessels being rendered incapable of the deposition of the proper materials of local supply. Thus also secretion is interrupted by the derangement of the vascular actions of the part. Under the general as well as local influences of inflammation, the blood itself undergoes remarkable changes of composition. Its not unfrequent buffiness or siziness has been already noticed and accounted for by Andral's observation of the proportional excess of fibrine ; the adhesion of its globules to each other has attracted the remark of microscopical observers ; and the formation of pus, which is looked upon by Gendrin to be little else than a direct conversion of the globules. He maintains the unsatisfactory notion, that this conversion is a merely chemical process. Pus, which is generated in so many varieties of inflammation, becomes endowed in those which are specific in their nature, with certain specific and peculiar characters, as in contagious diseases for example.

Every portion of the body, while living and supplied with nutrient vessels, is liable to inflammation. The hair itself is inflamed in plica, a malady scarcely known except in Poland, though some rarer cases of it are recorded as occurring in natives of other countries. It attacks the lowest and filthiest class of Poles, whose hair becomes matted, thickened, softened and entangled together, so as to form a foul and hideous mass, which they tell us is from time to time loosened and thrown off. A case is related by Larrey of preternatural sensibility of the hair, in a French soldier—probably an instance of slight or incipient plica.

The cuticle is not exempt from morbid affections, of which inflammation is at least an element. I have seen herpes occupying for years most superficially the delicate epithelium of the lip, and productive of very considerable pain and irritation. The nails, around their roots and edges, as far as the remotest vascularity reaches, are subject to obstinate and tormenting inflammation. The various exanthemata reside in the cutis vera, and seem to derive their peculiar characteristics rather from the cause which produced them, than the texture of the part which they occupy. The cellular tissue is the seat of phlegmon and carbuncle. The

former is circumscribed by the deposition of adhesive lymph, around the abscess in which pus is effused. This deposition partly—Gendrin says exclusively—forms what is vulgarly called the core; a portion of which often consists of sloughing shreds of the cellular tissue. In carbuncle, this sloughing is frequently very extensive, and there is no disposition to limit the effusion by fibrinous adhesions.

Serous membranes—the pleura, peritoneum and the meninges of the brain, are very liable to inflammation. In its progress, their delicately smooth surfaces become roughened, and coagulable lymph exudes, which is organized by the formation of vessels, and constitutes the medium of a permanent union between them. They also effuse serum and pus of varied amount and appearance—as in empyema—hydropleura, etc.

Mucous membranes—of which we distinguish three large tracts; that lining the nose and respiratory apparatus; that of the digestive tube; and that investing the urinary and genital organs—are the seats of some of the most important and familiar phlegmasiæ. The changes induced upon these membranes by inflammation, must be carefully studied by all of you. The villous surface is first reddened by injection of its vessels; becomes swollen or thick, and somewhat rough and rugous; its secretion is more abundant and thinner, sometimes as in coryza acrid and irritating; lymph or fibrine is in certain cases thrown out, as in diphtherite, croup and diarrhœa tubularis, and may be organized by the formation of small vessels, adhering as a pseudo-membrane. Pus very often exudes from inflamed mucous surfaces, as in bronchitis, dysentery and gonorrhœa. Vesicular protrusion or pustulation also affects the same parts, as in aphthæ and small pox, and, as Horner affirms, in cholera; and as Watt declares, in pertussis. Ulceration is one of the ordinary events of inflammation of the mucous membrane. Absorption is among the usual changes described by Kaltenbrunner, and goes on concurrently with effusion of lymph and suppuration; when the first of these processes predominates, we have an ulcer, to which indeed all the tissues are more or less liable.

Dothinenteria, ulceration of the intestinal mucous membrane (first correctly described by Bretonneau) is a very common attendant, as you will learn, of protracted fevers. It may occupy

the villous membrane in general, or the orifices of the mucous follicles or the glands of Peyer. Though usually shallow, it may erode the intestinal tissues. Chomel inclines, however, to think that the parts give way under gaseous distention. Ulceration of the throat and mouth is unhappily a very familiar form of disease ; it is perhaps less frequently seated in the respiratory tube, but is occasionally met there, as in chronic laryngitis. I had presented to me by a friend, under whose care the patient died, the larynx of a child into which ulceration had extended from the tonsils and trachea, while in other points the adventitious membrane above spoken of was still adherent.

The cerebral tissue is liable both to indurative, lymphid effusion, and softening from absorption. These degeneracies of structure are of course attended with corresponding impairments of function. Pus and serum are at times abundantly poured out from the membranes of the brain, on its surface and in its cavity, and thus we have the result of mechanical pressure complicated with or substituted for those of inflammation proper.

The fibrous tissues, which present a great variety of anatomical arrangement, offer similar variety in the modes of inflammation which affect them. Rheumatism is among the most prominent of these. It attacks the muscles, the tendons and aponeuroses, the capsular ligaments of joints, and the periosteum of bones ; even the skin is liable to its invasion. Carditis is known to be very often, if not always rheumatic. In rheumatic inflammation, suppuration rarely occurs ; the vessels throwing out usually a gelatinous or serous effusion, or perhaps depositing earthy matter. In one patient, however, I met with abscess in two places—near the knee joint, forming under the ligament of the patella, and around the middle finger. The same parts are liable also to arthritic inflammation, an acutely painful modification of the disease, paroxysmal and obstinately recurrent. In gout, suppuration is as uncommon as in rheumatism ; the vessels affected here deposit, especially about the smaller joints, an earthy concretion, phosphate of lime, etc.

The complex tissues of the glands and internal viscera, are subject to a diversity of modes of inflammation, which may terminate in abscess and ulceration with extensive loss or “melting down” of the original parenchymatous structure ; or there

may be, as formerly stated, mere atrophy or silent absorption. But the more common and interesting change occurring in these organs, consists in a hardening or induration—a scirrhus state, as it is generally phrased. This is supposed to depend chiefly upon the deposition of lymph or fibrine among the molecules of the parenchyma, and in the cellular interstitial membrane. Of course, the functions of the part are thus impeded. There may be also at the same time a form of hypertrophy with great enlargement.

Ulcerative absorption, already treated of in a cursory manner, is singularly susceptible of modifications from cause, being either simple or specific. We call it simple when consequent upon ordinary inflammation, or induced by long continued pressure, the application of intense irritants, corrosives, etc. It is specific when it is the result of a cause of peculiar character, contagious or epidemic, as in syphilis, cynanche maligna, and the like. I have already mentioned the frequent occurrence of ulcers upon the mucous membranes, and especially that of the digestive tube. Young infants are extremely liable to aphthous affections, as cause or consequence (for this question is not easily determined) of many disorders of the bowels. In numerous individuals, the whole life is tormented with painful and irritable ulceration of the cheeks, gums, lips and tongue, which, in some, seem the mere effect of local influences, but in others, are clearly connected with general derangement. Ulcers attacking the stomach itself, sometimes perforate all its tissues; at others, burrowing deeply, while its substance is thickened by surrounding inflammatory deposition, they interfere with the performance of all its important functions, and render the existence of the patient an oppressive burden. Such was the situation of the great Napoleon, and in this wearisome and tedious manner, was fretted to extinction, a life which had been productive of more varied and magnificent results than those of all the kings and conquerors who have ever worn crowns or grasped sceptres.

The surface of an ulcer, though formed by absorption, is a secreting surface. The fluids thrown out differ according to the nature of the cases. A simple ulcer discharges pus mixed with serous, and perhaps sanious matter.

Specific ulcers secrete a peculiar fluid, which, beside its char-

acteristic vital properties of a morbid nature, such as its contagiousness in contagious disease, is also possessed, as we learn from Crawford and Thomson, and as it seems indeed reasonable to infer, of definite chemical qualities and composition.

Ulcers are either indolent and stationary, or progressive and irritable—or disposed to heal. In the first instance, the acuter degrees of inflammation with which they were originally connected, has subsided, and left them callous and insensible—perhaps by a free deposition of mere lymph, which, from defect of vascular action, does not become organized, and is silently removed. They are progressive in various ways—by a predominance of the absorption which originally caused them; by a sudden and vehemently excited action of the absorbent vessels, attended with high irritation and inflammation of the surrounding parts, as in the corroding ulcer of the uterus described by Clarke; and by the loosening of successive sloughs from the surface. Ulcers presenting the two last phenomena are called phagedenic, and are destructive to a degree of which an idea can hardly be given you. Thus may be destroyed every tissue of which the human body is composed, as in carcinoma and lupus, which attack and remove successively skin, cellular membrane, fascia, muscle, blood-vessel, absorbent, nerve and bone. Yet, in one at least, if not in more, of these modes of ulcerative inflammation, this corrosion of the part is often accompanied by a collateral or coincident morbid action of a contrasted tendency. “In a cancerous tumor,” says Clark, “the deposit of new matter more than counterbalances the effect produced by the action of the absorbents, and the thickening and the destructive process proceed simultaneously.”

The healing of ulcers is a phenomenon of much interest. The cavity formed is filled up, and the lost substance replaced by the growth of granulations. These, as described by Hunter, Thomson, and others, are red points and eminences of a glossy, shining appearance. They are supposed to be formed by and of coagulable or organizable lymph, into which the vessels that have deposited it extend themselves; thus, it becomes highly vascular and grows quickly. These separate points approaching, adhere to each other, and when at last they have attained

the level of the original surface, become covered with epithelium or cuticle—thus cicatrizing.

Let me remind you of the fact formerly stated, that this filling up is never a perfect re-production. An external eschar is never precisely identical with true skin; the villi of mucous membrane are never re-formed on the cicatrices; lost muscle is supplied by a dense cellular or tendinous substance; and even bone, though replaced by an earthy deposit similar in chemical composition, wants the nice cellular arrangement of the original, and can easily be distinguished from it.

Mortification is the worst and most deplorable of all the local effects of inflammation. It is briefly defined to be “the death of the part affected,” but the idea thus conveyed is somewhat inaccurate as well as wanting in precision.

A part in which mortification has occurred, is by no means in the same condition as if simply dead, that is, a portion of a dead body, for mortification is as easily distinguishable upon a corpse as in the living patient; but it is a peculiar mode of disorganization, of which death is the uniform coincident, or the essential consequence. The words gangrene and sphacelus then, must be understood to imply always disorganization as well as death. These ideas are by no means necessarily or invariably connected. Many modes of disorganization are consistent with the continued vitality of the part, as in the widely diversified structural degeneracies met with in all the tissues, and forming parts of the history of carcinoma and fungus hematodes. Mortification being thus the ultimate result of many series of diseased actions, will present appearances somewhat different, in accordance with the diversity of causes to which it is owing. As eschars from various modes of ulceration are familiarly known to be unlike each other, so the sloughs from heat, from cold, from spontaneous gangrene, from the use of ergot as food, etc., etc., are all described as peculiar and characteristic. The occurrence of mortification is often if not most usually to be explained by reference to the state of the constitution; thus it is most likely to attend inflammation in low debilitated subjects, in typhoid fevers, and in the diseases and accidents of old drunkards. When it is about to ensue the part becomes of a purplish red, the swelling loses its

firmness and elasticity, and is soft, flaccid, and doughy; on the skin vesications appear and the hue grows darker and darker to perfect blackness. On mucous surfaces, as in the mouth and throat, the gangrenous points are of grey or ashy color. Very generally, though not always, sphacelation commences with an increased intensity of pain mingled with sensations of heat and burning, but this augmented sensibility soon declines and is totally lost.

Different tissues are in various degrees susceptible of mortification. The mucous membranes and the skin seem to be most liable to it. Bone is frequently attacked with caries and necrosis. The extremities are subject to dry gangrene, a disease well described by Pott. Parts thus deprived of their vitality, if their integrity be not essential to the continuance of life, and if the general system retains any considerable portion of its vigor and energy, are soon separated from the living substance to which they were attached, and thus loosened, fall, or as we phrase it, are thrown off. The process by which this is effected is called sloughing, and is generally spoken of as the result of the action of the absorbent vessels in removing the layer of living tissue originally in contact and connection with the dead matter. I would rather ascribe it, at least in great part, to the coincident secretion or effusion from the extreme vascular points of the living substance, which must now resemble in condition the surface of an ulcer, pouring forth pus and serum and thus detaching, thrusting away and washing off the dead fibres and molecules of the mortified mass. This result of inflammation is comparatively rare in the parenchymatous viscera. I have, however, seen gangrene of the lung, liver and spleen, and gangrene of the cerebral substance is mentioned by writers.

In considering, as we proceed briefly to do in the next place, the controlling and modifying influence of the causes of inflammation, it is proper to subdivide them into the predisposing and exciting. Predisposition may be local or constitutional, permanent or temporary, but if existing in any notable degree, its force is almost resistless in determining the form, character and result of inflammation. Thus, in a gouty system, whether the arthritic diathesis be hereditarily derived or newly built up, any accidental excitement will produce a characteristic paroxysm.

A blow upon the foot, a twist of the ankle, or any other general cause of inflammation, will bring on a well marked and specific attack of gout. Thus also in the strumous habit, scrofulous affections of the eye and of the glands, of the knee and hip joints, will arise from slight and common causes and follow a peculiar and but too familiar track. In rheumatism it is known that a first attack always leaves the patient more liable to a second, and that this proclivity is increased by every repetition. In this and the other numerous instances of an analogous nature, it seems probable that some obscure change has been impressed on the local structure. I need only allude here to the temporary predisposition resulting from recent, and it may be transient circumstances, shown in the prompt blackening and gangrene of a pressed or an excoriated or blistered part in the typhoid fevers. You have all remarked, doubtless, in the most trivial wounds of certain individuals an unwillingness to heal, a tendency to take on painful induration, suppuration, ulceration. This is a very frequent annoyance to the intemperate, who are in this way singularly liable to erysipelatous extension of inflammation from any ordinary source; to carbuncle also, etc.

2nd. Of the modifying influence of the exciting cause of inflammation, it must suffice to offer you a few examples. Heat is among the most common of these, and the most characteristic point in the history of its effects is the strange and unfortunate tendency to contraction of the cicatrix, which distinguishes the eschar of a burn from all others. Cold alone produces pernio or chillblain. Baker's itch arises exclusively from the application of dough or fermenting flour to the hand. Cancer scroti shows itself only in chimney sweeps, as the effect of soot adhering to loose folds of skin. Tartar emetic, when rubbed on the surface, produces an eruption closely simulating variolous pustulation. Croton oil, mustard, pepper, cantharides, every separate irritant indeed, whether its action be simply acrid or chemically corrosive, may be affirmed to possess an energy absolutely peculiar and exclusively characteristic; no two of them giving rise to inflammatory processes of similar or identical nature when applied to any part of the body. So also of the secretions of contagious disease: each excites a specific and peculiar malady which cannot be mistaken or counterfeited.

Having thus spoken of the direct results of inflammation, and of the modes in which it is impressed by the structure or anatomical contexture of parts, on the one hand ; and on the other, by the character of the causes which give rise to it,—let us for a moment consider the nature and influence of these modifications, as exhibited in their sympathetic effects upon the general system. The degree of pain, I have said, observes an uncertain proportion to the inherent sensibility of the tissue affected ; the suddenness of the changes going on ; the character of the cause producing it, and the constitutional susceptibility of the patient. When intense and protracted, it may prostrate the subject suddenly and irrecoverably, by a directly exhausting influence on the sensorial system ; its influence is frequently productive of syncope and nausea ; and when the strength is less impaired, of cramps, convulsions and delirium.

The derangement of physiological function of any part, is a necessary effect of its inflamed condition, and of the impairment or deterioration of structure which may result, as when we have deafness from otitis, blindness from ophthalmia, atrophy, from induration of the mesenteric glands, etc. ; but besides this, there is a frequent diffusion or extension of mischief sympathetically ; as when the stomach refuses to perform its offices, on account of inflammation of the duodenum, liver, pancreas or spleen. Yet these consequences, both direct and symptomatic, are occasionally evaded in a manner difficult to be understood, and we detect unexpected lesions, in post mortem examinations, in parts and organs which had exhibited no impairment of function ; as in the case mentioned by Hastings, of extensive ulceration of the stomach discovered after death in a subject who had always digested well.

Of all the sympathetic effects of inflammation, however, that general disturbance of the organism to which we give the name of fever, is the most interesting. Arising from almost every form and circumstance of inflammation, however caused and wherever located, it assumes two distinct and well known types. The first commonly designated inflammatory symptomatic fever, supervenes early in the case, while the immediate influences of the accidental injury or other efficient cause are urgent, and while the vigour of the patient is unabated. It is a continued fever,

exhibiting little or no remission. We see it daily following a severe blow, a fracture, a dislocation, a sprain, a wound, a surgical operation. It belongs too to the history of the acute phlegmasiæ. Its violence is said to be generally proportioned to the sensibility of the part, and of the constitution, and to the intensity of pain suffered by the patient, as we often witness in ophthalmia, otitis and orchitis. But these elements do not stand in the relation of cause to it ; for neuralgia, one of our most acutely painful affections, is seldom or never attended by it ; and Travers records its frequent absence in cases of irritable breast and testicle. Objection has been made to our applying the same phrase, "inflammatory symptomatic fever," to denote the condition which arises from inflammation of a spontaneous character, the acute phlegmasiæ, pyretic affections, and that which follows mechanical causes, wounds, accidents and injuries of whatever kind. As far as the history of the phenomena can go, however, to make out the pathological identity of the two, it must be considered as established. The chill or rigor so often though not uniformly the invading symptom—the heat and dryness of skin succeeding—with thirst, pains in the head, back and limbs, disturbance of sensorial and circulatory functions,—in short, all the elements which constitute fever in all its forms, are here collected. There is nevertheless one striking discrepancy, which deserves notice. In cases of external causation, the febrile disturbance of the constitution does not show itself, until a notable interval has elapsed after the infliction of the local injury, appearing indeed to be gradually developed. When connected, on the other hand, with the several phlegmasiæ, it would seem to invade simultaneously with the local inflammation. Thus in pleuritis, enteritis, phrenitis, etc., fever if not among the very earliest symptoms, shows itself so soon, after the first pain is complained of, that no notable interval can be marked for the most part. Hence it may be reasonably doubted whether, in the pyrexia, the local and constitutional derangements stand in the relation of cause and effect to each other, as has been by some pathologists so positively taken for granted ; and whether it is not more consistent with the order and connection of the observed facts, to regard them rather as coincident effects of the same efficient cause. Let us refer, for an illustration of this view, to one of the exanthemata. In

small-pox taken in the natural way, we have first fever, then local inflammation, and again fever, now plainly symptomatic, dependent upon and proportioned to the extent of cutaneous pustulation. Nor does the degree of fever seem to be in the proper and regular way prominent according to the violence of local inflammation. This may be said to be uncertain in all the pyreptic affections;—most so perhaps in bilious colic, in which with great vehemence of febrile excitement, there is usually but little intestinal inflammation. It is interesting to remark farther, but very difficult to account for the diversity in the train of special symptoms connected with and apparently dependent upon the various inflammations of organs and tissues.

In phrenitis, pleuritis and carditis, for example, we have a full, hard, bounding pulse, and the system of the patient seems to retain all its organic force and resiliency. In gastritis, and enteritis, and peritonitis, on the other hand, the pulse is small and oppressed and irregular, and the patient sinks rapidly with great muscular weakness and sensorial prostration.

2nd. The second form of symptomatic fever above alluded to, is known as hectic—is of intermittent type; may also arise from almost all sources of local inflammation, but does not occur in their early or acute stage: connecting itself exclusively with the chronic or sub-acute inflammations, and the insidious, such as disorganize and destroy by slow degrees; and rarely or never makes its appearance until the system has lost much of its powers of action and resistance by protracted suffering or profuse loss of fluids. It was formerly ascribed specifically to the absorption of pus; but this notion is now obsolete and abandoned.

Of the therapeutics of inflammation, it is not expedient to speak here in detail. I have contended, that it is essentially a morbid condition, which may be connected both with increased and with diminished action; may be either sthenic or asthenic; and the distinction will require always to be carefully drawn. In the former condition, perhaps the most frequently met with, we detract blood and apply sedatives; we use leeches and cups and scarifications, and cold in various forms and saturnine lotions, etc. In the latter, we stimulate in such modes as may be convenient, using astringents and acrids—capsicum, kreosote, cantharides, etc. Local inflammation bears better, however, even when

of apparently sthenic character, the application of stimulants, than those allow who would have us always believe it dependent upon increased excitement and action. I find no difficulty in explaining their curative effect by referring to their alterative influences, subverting the diseased actions specific in their nature, and substituting for them transient morbid changes, the evanescent results of the remedy employed. Thus it is that herpes is cured by so many of our harsher irritants—the Spanish fly, citrine ointment, and corrosive sublimate—and thus the mineral acids and arsenical solutions are extensively useful.

The same principles are proper to direct us in the general or constitutional treatment which becomes necessary upon the developement of the symptomatic affections. The system is either in an entonic or atonic condition, and our measures must be modified accordingly. In the first we advise venæsection, and administer active purgatives, and prescribe antimonials, and reduce the diet of the patient. In atonic cases and debilitated subjects, we pursue a course somewhat contrasted; allowing a nourishing and genial regimen, and admitting the prudent exhibition of tonics and stimulants, of which bark, iron and wine are preferred.

By many writers mercurials have been vehemently advocated as adapted to the management of all forms of inflammation, attacking or seated in every variety of tissue and structure. I am not disposed to admit the rule thus absolutely laid down. Mercury is of admirable utility in inflammations of the mucous membranes, and especially those of the digestive tube; generally speaking too, in the glandular and parenchymatoris. It is of less service in those of the serous membranes, and is not often beneficial in the arthritic, rheumatic and carcinomatous.

The most important and most universally adopted of all our remedies for inflammation is opium. The painful irritation which forms so usual and prominent an element of the attack is most remarkably, if not exclusively, subject to its divine control. Congestion too, undergoes from its influence, a more ready solution than from any other article or formula. It is thus, by its direct effects upon these two morbid conditions, irritation namely and congestion—almost invariable antecedents, elements, or attendants of inflammation—our most efficient preventive as

well as curative resort; but its administration requires to be properly timed and carried to an extent sufficiently free and unhesitating, to secure its remedial operation, as anodyne, narcotic and calmative.

CHAPTER III.

DISEASES OF THE CIRCULATORY SYSTEM—FEVER GENERALLY CONSIDERED.

"IN teaching the practice of physic," says Cullen, in his admirable "First Lines," "we endeavor to give instruction for discerning, distinguishing, preventing and curing diseases, as they occur in particular persons."

We discern or know the existence of a disease by the observation of its symptoms or phenomena; these you have heard detailed at some length.

We can only hope to prevent its access by the avoidance or removal of its causes, whether predisposing or exciting. This department of hygiene has occupied us to as full an extent as time and circumstances permitted.

It only remains then for me to point out how and by what characteristics diseases are to be distinguished, each from every other, and to treat of the application of the remedial means proper for the cure of each.

In the performance of this portion of my duties, I shall place first upon the long catalogue before us, the maladies which are seated in the organs, and affect directly the function of Circulation. These are indeed, in every sense, topics of paramount importance, demanding our earliest and principal attention. The great number and variety of this class of diseases; the frequency of their occurrence; the interest attached to many of them on account of their violence and rapidity; and the fact of their being sympathetically induced upon and associated with so large a share of the disorders of other systems, all entitle them to the

prominent place thus assigned them. The most obvious of these diseases of the circulatory system, are those which affect the heart itself, the central organ of the system—carditis, palpitation, syncope, angina; and such as exhibit themselves in the minute or extreme vessels; of which latter, inflammation is the principal developement, perhaps, though we must rank with it, as located in the same tissue, certain hypertrophies of morbid character, and most forms of disorganization and deterioration of structure—hæmorrhages, dropsy and congestions. On account of the very frequent connection of inflammation with almost every varied mode of morbid action in the animal body, whatever seat they may affect, and to whatever structure they may be attached, it has been thought proper to institute a preliminary discussion of its history, causes, symptoms and consequences. With all these details, modern writers have inextricably interwoven the general subject of irritation, which it was deemed necessary therefore to investigate at the same time.

From these the transition is easy and natural to the great topic of Fever, demanding our immediate consideration, as comprising so many of the diversified phenomena of irritation, inflammation and congestion—of all forms of vascular and sensorial derangement. The combination of symptoms which we are accustomed to comprehend under the name of fever, intrude themselves upon us either essentially or incidentally, during the progress of almost every malady enumerated by nosologists; in a majority of which, indeed, their presence is characteristic—or at least essential and inevitable.

Hence it is the especial duty of the student, at the very threshold of his professional career, to devote his most earnest and profound attention to the investigation of these preliminary and elementary matters; without a proper understanding of which, indeed, his farther progress will be extremely painful and uncertain.

OF FEVER.

Fever is almost universally regarded as the widest outlet of human life, and has hence been for ages an engrossing theme with the ablest medical philosophers. We must confess with sorrow, what it would be presumption to deny, that this diligent

and persevering inquiry has been attended with a degree of success far from flattering, and that we are still, in reference to the whole subject, involved in lamentable ignorance and uncertainty. To detect clearly the intimate nature of fever; to discover the essential mode or modes of morbid action in which it consists; to throw light upon these points, so long wrapt in impenetrable obscurity—"atra caligine mersa"—would indeed form an era in our art; would constitute emphatically a revelation in medicine.

Few writers have hesitated to acknowledge the vagueness of the views entertained concerning some of the observed phenomena, and the difficulty of defining what was so imperfectly understood; a large proportion of them have nevertheless ventured to propose, each in his turn, a doctrine or "theory of fever," as the phrase is, which should expel and serve as a substitute for those of his predecessors. It would not be difficult to show the insufficiency and inexactness of every one upon this lengthened and still accumulating catalogue, but the task is so ungracious, that I shall avoid it as far as is consistent with my duty.

To describe, however, is far easier than to define; and many physicians, both ancient and modern, have drawn and transmitted down to us, pictures or portraits of the several types of fever, which deserve, for their graphic vividness and their exact correctness, the most unqualified praise.

You will not expect from me any additional attempt at promulgating a theory, or striking out a definition of this Protean disease; and I cannot describe it to you better than by a familiar quotation from Fordyce, which with all its simplicity and quaintness, is often referred to as conveying more truth than is to be found elsewhere in the same brief limits.

"A fever," says Fordyce, "is a disease that affects the whole system; it affects the head, the trunk of the body, and the extremities; it affects the circulation, the absorption and the nervous system; it affects the skin, the muscular fibres and the membranes; it affects the body and likewise the mind. It is, therefore, a disease of the whole system, in every kind of sense. It does not, however, affect the various parts of the system equally and uniformly; but on the contrary, sometimes one part is much affected in proportion to the affection of another part."

The incipient changes, the primary modifications of action in

fever, have not been detected or pointed out, but there is no want of hypothesis on the subject. The solidists generally, assume that they are of the nature of irritation or of inflammation, excited in the first instance by some agent capable of impressing an irregular or morbid influence directly, or secondarily by reaction supervening upon a transient state of debility or prostration. A few have regarded these impressions as determining rather congestion than inflammation.

The humoralists maintain, on the other hand, that the earliest tokens of febrile disorder are to be found in the altered condition of the vital fluid, to whose deleterious qualities they consistently attribute many or most of the phenomena subsequently developed in the progress of the attack. In recent days this doctrine is vehemently advocated by Stevens, and seems to have found favor with Chomel, in whose hands the discussions on this question have assumed a new and increasing importance.

Almost all pathologists admit and dwell upon a concurrent disturbance of the sensorial and vascular systems, as essential and characteristic in the history of fever. Hoffman believed the disease to consist primarily in diminished energy of the nervous system. Cullen goes a step farther, and argues that this diminished energy of the brain brought on spasm of the extreme vessels, which spasm was the real proximate cause of fever. Rush maintains at some length, and with his usual ingenuity, that fever consists in convulsive action of the blood vessels. There is undoubtedly present a convulsive irregularity of action of the heart, as shown by the abruptness or jerk so generally met with in the febrile pulse, and an undefined derangement of the functions of the extreme vessels, of which we have abundant evidence in the alternate constriction and turgidity, heat and chilliness, harsh dryness and clammy relaxation of the cutaneous integument, as well as in the obvious changes occurring in the secretions from all the glands and surfaces of the body.

The phenomena of fever indeed, prove distinctly enough the co-existence of these prominent conditions ; "the great difficulty in the pathology of fever consists," says Gregory, "in showing in what manner these disturbances of function are connected with each other." Feeling this difficulty, in common with my predecessors, you will remark that I have simply expressed, or

stated the observed fact without any attempt at explaining, or accounting for it. This I acknowledge to be entirely out of my power—nay, there has not yet been offered a reasonable conjecture as to the relation which these two conditions hold to each other; whether they are linked together as cause and effect, and if so, which of them deserves to be considered the source of the other; or whether they are not rather the coincident results merely, of the impression of some common morbid agent.

It is usual to speak of the derangement of the sensorial system as a state of “diminished energy,” and of the vascular disorder as implying of course “increased excitement and more forcible action.” I will not affect any very special nicety of discrimination in a matter so obscure, but suggest that the symptoms of derangement of the functions of these important systems, are of complex or combined character, and exhibit in both of them, each of the above conditions—proving that with some loss of actual energy or power, the excitement in both is increased, and the action has become irritated and forcible beyond a due proportion to the capacity for action in the organs concerned. Hence the debility so soon induced, and hence the irregular determination to structures or surfaces, predisposed to derangement and disease.

Farther, although such phrases may suffice to refer to many of the phenomena, I cannot satisfy myself in regarding the true pathology of any disease as a mere question of less or more—plus or minus. Not only is there evidence of irregularly defective innervation in some parts of the system, and morbidly intense sensorial action elsewhere, but the mental operations and the sensitive perceptions are usually deranged in a notable manner, as shown by delirium, and by depraved states of the organs of sense. Not only do we meet with local hyperæmia, active and passive congestions, and inflammations, but we find the blood morbid in its qualities, and all the secretions vitiated. The true question is as to the precedence and succession of these changes. The solidists affirm that the organs are disordered in the performance of their functions merely by undue determination, and excitement deficient or excessive: the humoralists that the fluids are changed in condition previously to any perceptible

changes in the modes of organic action. Thus Potter tells us that, in experimenting on the subject, he found the blood altered in appearance during the prevalence of yellow fever, in persons who as yet retained seemingly their usual health ; these changes in the blood being, occasionally at least, the precursors of an attack.

I shall not hesitate to retain the long established distinction of fevers into Symptomatic and Idiopathic. My senses and my reason both recognize an obvious difference between the febrile disorder consequent upon, and produced by, a wound of soft parts, dislocation of a joint, or fracture of a bone, and that which, however apparently analogous, arises without the occurrence or manifestation of any notable accident, or evident change previously affecting the body, or any of its parts ; and there seems to me little risk of confounding exanthematous fever, and that which is connected with inflammation of the pleura, or of the brain, with any of the numerous types attributed to malaria, and offering at their invasion no constant injury of a special organ, but rather dividing (as in the faithful sketch from Fordyce,) its disturbing influence over the whole constitution. Notwithstanding these points of separation and contrast, however, which seem to afford safe and broad ground for a rational diagnosis, the weight of modern authority is decidedly in favor of considering all fevers as symptomatic—the extension of general irritation and disorder from some local affection. There is much dispute, however, as to the point of local origin. Clutterbuck fixes it in the head, and regards fever as nothing more than the secondary or constitutional result of inflammation of the brain and its membranes. Broussais attributes it to an inflammatory irritation of the mucous tissue of the digestive tube, and especially the stomach. With vastly more plausibility others have rejected these exclusive theories, and considered all irritated and inflamed organs, as centres from which may radiate the different modifications of fever. Thus Professor Marcus finds in the brain the original irritation upon which typhus is generated ; in the lungs that of hectic ; in the trachea, that of catarrhal fever, etc.

I am not disposed to pursue this discussion, and shall therefore hazard but one remark farther on this point so warmly

disputed. It is highly probable that no cause of disease possesses such indefinite extent of impression, as to act at once upon more than a single part; and besides, it is consistent with all analogy to suppose that every cause of disease is determined to, and fitted to act specifically, or at any rate specially upon one organ or tissue. It follows, therefore, or it is highly probable, that all disease is, to speak with logical precision, local in its origin.

But, on the other hand, the observed facts do not bear us out in the dogmatical assumptions that I have above alluded to. We do not know that the cause of fever exclusively affects the solids in the first instance. Admitting the solids to be primarily affected, we do not know upon which of them the earliest impression is made—whether upon the surfaces, or within the substance of organs—the cerebral mass, or the mucous membrane. We do not know the nature of the primary impression, whether it be sedative or stimulating. We do not even know the character of the first link in the chain of notable acts, whether it be irritation in any one of its vague senses, spasm, inflammation or congestion. Nay, to conclude this summary confession of our ignorance, we know not whether either of these is essential to the existence of fever, or whether they may not each, or all of them, occur separately or coincidently. We meet with them all in the progress of the various types of fever; yet not promiscuously, but in connected trains, seemingly allied to, and dependent upon each other. I repeat then my accordance in the ancient belief of the existence of a class of fevers properly contradistinguished as *Idiopathic*. The original irritations, or primary local affections so much talked of, whatever be their nature, are often extremely obscure; nay, they may escape our notice entirely. It frequently happens that they do not present themselves, or attract our attention until so late a stage of the case, that it is much more reasonable to look upon them as consequences, than as causes of fever.

It would answer no very valuable purpose, to go minutely into an investigation of the merits of the theories of fever which have, from time to time, flourished and sunk into oblivion. In the majority of those which have been most extensively received, you will perceive a singular concurrence in the assumption of

debility as an essential precursor, or characteristic symptom, or a necessary portion of the history of the disease. Brown makes debility its very elementary essence. Cullen builds the whole of his fanciful doctrine of fever upon this idea. Debility is the cause of the cold stage, which brings on the hot stage, which, in its turn, produces the sweating stage. His first link in the chain, is an atony and spasm of the extreme vessels, and the phenomena of fever are the consequences of the efforts of nature to remove this state of things. Rush regards debility as an indispensable pre-requisite—the disease consisting, according to his views, in the re-action which results *ex necessitate* from this state of depression. He does not allow re-action to be owing to any such cause as the supposed energy of a *vis medicatrix naturæ*, but affirms it to be necessary and mechanical. Darwin very plausibly makes this re-action or excitement following debility, the effect of stimuli upon accumulated excitability; a most ingenious but unsatisfactory idea. It serves to explain the phenomena of intermittents only, and cannot be applied, as you will at once perceive, to remittents and continued fever, more especially in long protracted cases of the last mentioned type. To a precisely similar objection, the thermo-electrical hypothesis of Folchi is liable, and it is here equally fatal. This author supposes a fluid to be evolved by the natural and healthy actions of the sensorial system, which is, as the title imports, calorific as well as physiologically excitant, diffusing warmth and vitality throughout the body. When it is, under any contingency, carried off too rapidly, you have chill and prostration; then comes re-production of the thermo-electric fluid, accumulation, re-action, with accelerated circulation and respiration, constituting fever.

Some of the causes of fever are notably, and beyond doubt, of an exciting or stimulant character. These occasionally act with prompt efficiency, and give direct origin to unequivocal symptoms. Exposure to the heat of the sun, violent muscular exercise, undue mental exertion, and various modes of excess, bring on immediate attacks of fever.

It is also true, on the other hand, in numerous instances, that an interval of greater or less duration elapses after the application of a cause, and a latent period passes by, marked by no morbid development—no change in the usual health of the in-

dividual affected. It is true farther, that the intensity of a stimulant cause may sometimes so exhaust the subject as to bring on a preliminary state of depression or prostration; but, after all, it is probable that a large class of fevers derive their origin from causes of a sedative nature, among which I should be much disposed to rank both malaria and contagions. Famine and confinement in vitiated air are, beyond question, to be arranged under this head.

The true matter in debate here is, whether debility is, or is not, the essential first step in the train of morbid effects—the efficient and necessary source of the subsequent symptoms. I have already said that I consider it an unfailing condition or element in the history of fever, and that it is a very general constituent in what we term the state of predisposition; but I am very far from admitting its title to be regarded as the cause of the changes which take place in the development of a febrile attack. Let me be understood. I do not deny its importance as a predisposing state of the system, which must be when enfeebled in whatever mode most ready to give way to the impulse received from an agent which has come into recent contact with it, and must yield with less resistance to the impression of a present one. I only refuse to admit its causative influence, considering it rather as one among the series of effects which, taken together, constitute the disease denominated fever.

We may regard debility, in the familiar phrase of the books, as either direct or indirect. It is direct, when occasioned by abstraction of the natural and requisite means of supporting the tone of the constitution, such as a proper quantity of food and drink, or of such stimulant as habit may have rendered essential to us. We take usually much more food than nature positively demands; we drink wine, alcohol, or some other exhilarating beverage; we smoke, chew or snuff tobacco. Subtract suddenly any of these habitual, though artificial excitements, and the action of our various organs will become languid and feeble. Darkness and starvation will tame the most savage animal; and to the human criminal, solitary confinement is said to be the most intolerable of all punishments—reducing the most refractory spirits, and bringing them down by the mere denial of so-

ciety and conversation, to the lowest state of physical prostration, and the humblest mental submission.

Indirect debility is, on the other hand, the consequence of action which has been unduly violent, or which has been beyond nature protracted. It here results obviously from a degree of exhaustion of the vital powers. The examples are numerous. Fatigue, want of sleep, intense study, violent emotions of mind enduring for any length of time, and convalescence from any acute disease, present you with illustrations which a moment's reflection will enable you to multiply indefinitely.

It is universally assumed, and seems altogether reasonable to believe, that under these circumstances both of direct and indirect debility, diseases of every kind, and fevers among the rest, find easiest access and admission into the system. But I have already alluded to the fact that fevers do (and not unfrequently) make their invasion without being preceded by any notable symptoms of debility. Yellow fever selects for the object of its attack the most robust and athletic Europeans and Northernmen, whom it assails suddenly and without premonition; and the latent period of our malaria remittents, country fever in particular, is often a period of undiminished enjoyment of the usual health and strength.

Nor do I perceive any relation to exist between the cold stage of an intermittent, and any imaginable degree of preceding debility. If the latter were the cause of the former, they should correspond in degree, and concur with some uniformity. The chill or ague should be most vehement when the cause producing the attack was most intense in its violence, and the invading disease endued with the greatest malignity. Such is by no means the fact. "A chilly fit," says Rush, "seldom occurs in the most malignant cases of fever." Yellow fever often assails, unpreceded by any cold stage, or even any observable chilliness; head-ache, and other pains, hot, dry skin, flushed face, etc. being our first intimations of the onset of the terrible malady. In the least dangerous cases of chronic quartan ague, on the other hand, the chill is violent, protracted and annoying.

It is a phenomenon ill understood and obscure; but I would prefer to regard it as chiefly and primarily affecting the nervous

system, and as the result of some morbid impression upon that system peculiar in its nature. This obscure peculiarity is strongly manifested by the striking differences which we note in reference to the cold stage among intermittents themselves, as well as the contrast presented between them and the other forms of fever, remittent and continued, ordinary and malignant.

In ascribing the long protracted vascular excitement of a continued fever, or the intense violence of a malignant intermittent, to the preceding state of debility or defective action in the system as their source, however transient it may have been in duration or apparently slight in degree, a most illogical error is committed. Strength is attributed to weakness, light to darkness, an effect to a cause directly opposite in its influence. I set aside entirely, as does Dr. Rush, the hypothesis of a *vis medicatrix naturæ*, whose existence is altogether suppositious, and of whose alleged operations, I have only to say, that if they are intended for the protection of the system from the ravages of disease, they are, to the last degree, ill-directed and capricious, and prove the ally to be far worse than the invading enemy. Rush himself acknowledges that the re-action (a word which he employs to avoid the acknowledgment of the imaginary *vis medicatrix naturæ*,) is often immensely disproportioned to the preceding debility, and attempts to illustrate the fact by reference to the violence of a storm succeeding a calm, and to the excesses of unrestrained passion. These analogies, however, must not be received as arguments, and no careful reasoner will ever yield the necessity of exact and definite proportion between cause and effect. The so called re-action is admitted to be very often, if not in a majority of instances, altogether disproportioned to the preceding debility; the latter, therefore, cannot be the cause of the former.

The latent period of fever, the time which elapses between the application of a morbid cause, and the commencement or manifestation of the train of effects to which it gives rise, deserves our attention in this place. It is most interesting to inquire what is the state or condition of the system during this period. Is the subject, over whom the sword of Damocles is thus suspended by a hair, is he to be regarded, shall he consider and conduct himself as if in the enjoyment of health! During the germination of the seeds of evil sown in the body, what obscure changes of

a preparatory kind occur; or are any such changes essential! This is by no means a merely speculative disquisition. If we can ascertain the nature and modes of operation of the hidden influences that are at work, we may, perhaps, arrest the mischief and efface or correct the morbid impressions, before time and habit have confirmed them. I have thought that something useful may here be learned from the history of intermittent or recurrent maladies. During their interval, (which is a true latent period,) we acknowledge the system to be in a peculiar condition, far and characteristically removed from that of true health, and institute a course of conduct based upon this view of the matter. We speak of patients, in these circumstances, as laboring under a strong and tenacious, it may be an irresistible predisposition, which no one will deny to be actual disease in a very definite sense of the word. In certain cases we have discovered remedies closely—nay, almost specifically applicable to this state, as cinchona to the cure of Intermittent. Believing the preliminary to be closely analogous with the intercurrent latent period of this malady, I have been accustomed to advise the use of cinchona at the time of exposure to malaria, and throughout the period known usually to follow such exposure, before disease is developed, and I am satisfied of its good effect in this way as preventive.

This period is known to be under the influence of the ordinary revolutions which give periodicity to disease in general. It seems to exhibit some relation both to the capacity for resistance in the constitution, and to the force or intensity of the effective cause. In some instances it is exceedingly brief. An example is given by Alison, of a physician being seized with typhus fever immediately upon exposure at the bedside. I knew an individual arriving from our healthy upper country attacked with dengue on the third day, in the summer of 1828, when it prevailed in the city. Sometimes, on the other hand, the period is protracted, and the assault of the impending malady postponed almost indefinitely. Some of the sufferers from the fatal and disgraceful Walcheren expedition, (so notorious both in the military history and the medical annals of Great Britain,) were attacked as late, we are told, as six months subsequently to their escape from that land of marshes and malaria. The ap-

parent influence upon it of the septenary revolution, is familiarly noticed in our climate, where the opportunities for observation are unfortunately distinct and frequent. Our "country fever" is expected to invade on or about the seventh or fourteenth day, and if the twenty-first passes without an attack, most persons consider themselves entirely safe.

Many endeavors have been made to ascertain and fix the latent period of the febrile contagions, but nothing is yet known very definitely on the subject, except with respect to two which admit of inoculation with fluid matter. We anticipate with confidence the occurrence at fixed dates, of certain effects both local and constitutional, from the insertion of the virus of vaccine and variola under the cuticle. But if we inoculate with the saliva of a hydrophobic animal, the germinating or latent period is altogether uncertain. Let me earnestly press upon you a faithful and persevering attention to this obscure and interesting subject. We shall have more hope of fulfilling our highest and most gratifying duty—that of preventing disease, when we have learned to appreciate the incipient changes—the preliminary gradations of the latent period.

Cullen's definition of fever is admitted to be among the best that have been offered, and his successors have found it a far easier task to point out its defects than to present us with a preferable substitute.

"Pyrexia or fevers," he tells us, "are distinguished by the following appearances. Beginning with some degree of cold shivering, they show an increase of heat and of the frequency of the pulse, with the interruption and disorder of several of the functions, and diminution of strength, particularly in the limbs."

It is scarcely necessary to remind you that fevers often come on without any cold stage—without either shivering or chilliness. In some of the more malignant types, the skin does not acquire any additional heat—but falls permanently below the natural standard in that respect. Cases of this sort are known and dreaded in our own country where they are spoken of as congestive, in contradistinction to the ordinary inflammatory attacks. The pulse is occasionally met with of less than the average frequency. Dr. Musgrave tells us that he saw it in a yellow fever patient in Antigua beating not more than 44 in the minute.

Interruption and derangement of the functions is unquestionably attendant on fever uniformly : but the phrase is vague and inexplicit, as failing to point out what functional disturbance is essential or characteristic ; and it is well known that fevers differ among themselves, as to the particular organs, and of course functions affected. Nutrition is interrupted in fevers ; secretion, whether from glands or surfaces, impaired and vitiated. Hence we have thirst, nausea, furred tongue, dryness of skin or a clammy and offensive perspiration ; high colored and scanty urine, and constipation of the bowels, or diarrhœa, with acrid discharges. The diminution of strength is also, though a very general symptom of fever, liable to exceptions. I have seen it continue in some of our worst cases of yellow fever apparently unimpaired, until the near approach of death ; and what is more to the purpose, it is matter of common remark that, under many circumstances, the muscular strength of a patient is to a certain degree restored by the access of a paroxysm of fever.

To offer a plausible rationale of the phenomena of fever, successively and in detail, would be a very difficult task, consuming much time, and requiring much nicety of research and ingenuity of reasoning ; and after all, must be, in our present state of knowledge of minute physiology and pathology, in a considerable degree conjectural. For example, until we attain a more perfect comprehension of the mode in which animal heat is generated, we cannot explain satisfactorily the variations of temperature in the several stages and states of fever. At present it must suffice to refer them vaguely to the disordered condition of the nervous system. We account with similar indirectness for the depraved condition and partial suppression of the secretions and excretions. The increased velocity of the circulation, while the voluntary muscles act languidly, we ascribe to the irregular distribution of excitement, which is said here to be determined inordinately to the vascular system.

Among the chief points which have engaged the writers on fever, is the doctrine of its natural tendency to run a certain course, and to terminate "in the restoration of health." By those who advocate this doctrine, it has farther been made a question whether we can arrest, or cut short a fever in its

course; nay, it has been doubted by many, whether even allowing this to be possible, it is safe or proper to attempt it.

The ancient notion that a febrile paroxysm was a salutary effort of nature to free herself from some oppressive load, or morbid matter intruded by some means upon the embarrassed organism, suggested these doubts, and led numerous and otherwise sagacious physicians to support and aid the system in so trying a conflict. Hence originated the fatal practice of stimulating the patient in the treatment of fever generally, and plying him with cordials and heating medicines.

Do not suppose that I am combatting an obsolete or abandoned error. It is true, the principle is one which has scarcely contaminated American doctrines or practice in medicine, unless we admit the claims to notice of the patent school of vegetable or botanical Brunonians. You will find it laid down in the writings of the learned Gregory, that "although it may be sometimes practicable to cut short a fever, yet it can never become the foundation of our treatment in febrile diseases. The natural tendency of fever to come to a crisis, or to work its own cure"—I quote his very words—"may, on the other hand, be often kept in view with the best advantage; the spirit of the doctrine should never be lost sight of."

The same opinions are also promulgated and strongly maintained in the more recent work of Southwood Smith, which has been received by his professional brethren of England with almost unqualified approval and commendation. I have elsewhere stated my belief, that the tendency of all disease was to disorganization or death. But the cause which produces disease may be transient in its influence or in its application, or it is removed by some change of circumstances; it is originally somewhat less than mortal in its intensity, or its force undergoes diminution; the excitability on which it first acted wears out; the predisposition to which it was adapted, is altered in some mode; the system becomes habituated and thus callous to its irritation—as a ball will sometimes remain quietly lodged in a part which it had inflamed severely—owing to some one or more of these conditions, all amounting virtually to a removal of the cause of disease, it comes to an end (*causa sublata tollitur effectus*) before its natural tendencies are manifested in their ultimate result—

before either death or disorganization has occurred. It is thus we explain the apparently spontaneous restorations of health every day met with, and so apt to be attributed to the *vis medicatrix*—the restorative energies of the constitution. Let me add here my solemn warning to you, to confide charily and with cautious reserve, if at all, in this imaginary power. “It is a broken reed, which, if a man lean upon, it will pierce him.” Every one of those who have most strenuously contended for its existence, and built most confidently upon its support, will confess to you that its action is indefinite and irregular, and frequently disproportionate, in the highest degree, to the disorder it is intended to check or remedy.

Rush compares this disproportion to the violence of a storm succeeding the calm, by which, in his illustration, it is assumed to be occasioned, and to the excess of passion, which, aroused by a trifling affront, seeks for gratification in poison, assassination or duelling.

Trust not, I repeat, to the capacity for resistance in a system already disordered and disarranged. The office of the physician is to remove, if possible, the source of evil; to counteract its influences, and to diminish their intensity by every means in his power; to subdue the predisposing excitability upon which it is fitted to act and has acted; to change, by revulsive interference, the determination of its agency, and save a vital organ or a delicate portion of the animal structure by derivation to a stronger or a less important part.

I will scarcely stop to discuss the question of our power “to cut short the course of a fever.” Which of you, young as you are in medical observation, has not repeatedly seen a febrile attack abruptly arrested, and all its concomitant irritations, congestions and inflammations suddenly resolved by blood-letting; by emetics, by cathartics, by sudorifics, by quinine, opium, pipe-rine? Which of you has not witnessed the distinct, obvious and decided substitution of mercurial action, for the previous train of febrile symptoms?

Taking for granted, then, the power, I hold it to be worse than weak, to hesitate as to the propriety of using it, with the purpose to arrest as promptly as may be, the progress of every attack of this deplorable malady, and to control, as far as may

lie within our limited ability, all its influences. In this effort, we shall too often, alas! find our means scanty, and our resources inadequate—still we must dispute pertinaciously every inch of ground, and protract the struggle to the last moment of life. “*Nil disperandum*” should be the motto of every practitioner. However malignant the character of any disease—however violent its onset—however herculean its sway over the prostrate constitution, we must remember that death alone releases us from our obligations to our patient; death alone extinguishes our hopes, and puts an end to our exertions in his behalf. You will hereafter be rewarded for this constancy and perseverance by the happy success of some of your most anxious and doubtful endeavors for the relief of frail and suffering humanity, and you will learn with joy that the simplest of the remedies in your hands are capable of exerting a most beneficial influence, when directed in their application by a fearless courage and a calm and deliberate judgment.

The principle of periodical revolution, as you have heard, regulates notably the movements and actions of the healthy organism, and does not lose its directing force in disease. Many of the phenomena of fever seem to be specially under its control. This is exhibited most obviously in the course of intermittents of various type, and but little less so in the periods of abatement and exacerbation in remittents.

Upon an attentive observation and nice calculation of these periods, is founded also the ancient doctrine, of critical days in fevers of more continued character—that is, the supposition that febrile disorders are by their own nature disposed to terminate—whether favorably or unfavorably—rather at certain periods than at others, and that these periods are susceptible of being clearly known and designated. By the term crisis, is meant a sudden, considerable and spontaneous change, whether favorable or unfavorable, occurring in the course of a fever, and exerting a remarkable and decided influence on its character, progress, and ultimate result.

That such sudden and decisive changes do actually take place in the course of continued fevers, will not be denied by any observing practitioner; the true question is, whether they take place regularly, and at calculable periods? The weight of

authority is on this matter pretty equally divided, as well among the modern as the ancient physicians. The doctrine has descended to us from Hippocrates, and seems to have been originally founded upon the Pythagorean system of the power of numbers, supposed to extend through universal nature; the application of which was easy and obvious to times and periods in disease. The odd days, counting from the date of the invasion, constituted a large majority of the so called critical days. Hippocrates, however, appears to have regarded every day in the first week as evincing a disposition to serious change—in the second week, every alternate day—and in the third, every third day. Many of his commentators affirm, that he adds to all these the 21st day, but Cullen denies the propriety of this reading, and attributes it to error or interpolation in some of the early manuscripts. With this correction, the illustrious Scotchman receives the doctrine and advocates it warmly, adding the weight of his venerable name to that of the Coan sage—the time-honored father of medicine. In more recent times still, Robert Jackson, a writer of the highest respectability, whose treatise on fever I commend to your particular study, has taken especial pains to make out with distinctness what days are critical, and has labored strenuously to establish their paramount influence. He is at variance with Cullen as to the alleged change from a ternary to a quaternary period in the third week or after the eleventh day, and maintains that crises also occur on the 13th and 15th. Now, if we sum up the critical days as recorded in the several essays of the ancient and modern champions of the doctrine, Hippocrates, Galen, Cullen, and Jackson, we find them to include 13 in the first 21, viz. the 3d, 4th, 5th, 6th, 7th, 9th, 11th, 13th, 14th, 15th, 17th, 20th, and 21st, leaving but six non-critical, for we cannot properly include the two first. We cannot surely wonder, then, that in the natural course of things, a large majority of the crises should, as they assert, occur on the more than double number of days selected. It is unnecessary to go into any argumentative discussion upon this subject—indeed, the supporters of the doctrine claim the privilege of having it tested, not by reasoning, but by experience merely and observation. Observe, then, for yourselves; but if you should be unable to discover the potent and regular influence of critical

days, console yourselves with the reflection, that you are not the first who have totally failed in detecting or calculating these periods. Asclepiades and Celsus, two of the most venerable among the ancients, treated the notion with contempt; Jackson, whom I have already mentioned as its most earnest and vigorous advocate in more recent times, while he urges the necessity of attention to the subject, and remarks sharply, that "ignorance in this respect is the source of perpetual mistake and disappointment," acknowledges, nevertheless, that "the subject is difficult and obscure," and that "there is no decisive evidence on either side of the question;" going on to speak of the occurrence of cases of fever, "in which the patient might be said to wade through the disease," the changes being so slight at the points of time specified, that even his practised discernment could not mark them. Gregory, although disposed to admit the doctrine on the authority of the great names enlisted in its favor, allows that "these observations can seldom be verified in the fevers of Great Britain." To the mass of negative testimony on the subject, I must add my own, having failed entirely to satisfy myself of the influence of critical days in the fevers of our climate.

The distinction into separate types I conceive to be the limit of the effect of the periodical revolutions of the system upon febrile disease. A knowledge of these types, sometimes confused and rendered to a certain degree obscure by the disturbing agency of the efficient morbid cause, is in the most indispensable manner necessary to the practitioner; nay, I will go so far as to declare my belief that no single condition modifies so much the success of the practice of any physician in the fevers of these southern regions, as his more or less intimate familiarity with these variations of type, and his ability to calculate the times and periods of spontaneous change in fevers. Those who are fond of investigating obscure, and difficult questions in medical philosophy have taken profound interest in the inquiry, so fruitless hitherto as to the cause of these periodical revolutions. Not a few have been disposed to attribute them altogether—whether as exhibited in varied types, or in calculable periods of crisis, to the direct influence of the heavenly luminaries: Balfour has written most especially of this matter in reference to fevers. He sets forth in strong language the sol-lunar influence upon all

paroxysmal diseases—that is, the influence of the sun and moon, when in conjunction; and endeavors, with not a little ingenuity of argument, and some plausibility of fact, to sustain the positive affirmation that “exacerbations of fever may be expected to take place, and do indeed occur at the time of spring-tides, (conjunction,) and crises at neap-tides.”

On such points as these, it may be permitted to be sceptical, and although prepared to receive all as truth, which is supported by proper and sufficient evidence, yet it is our duty to guard ourselves against the evils of credulity and error, by a patient, conscientious, and rigid examination of testimony.

The remote causes of fever will be more properly treated of in relation to the several forms which they seem adapted to excite. Many of these causes I have said appear to be of stimulant quality, giving rise at once to irritation and inflammation. Others are undoubtedly of an opposite quality; remarkable instances of which will be found in the famine fever of Ireland, a malignant typhus, infecting whole districts in a state of starvation, and the analogous pestilence arising in jails, hospitals, and the crowded ill-ventilated hovels of the poor every where.

Of a large proportion of the obscure febrific agents, such as malaria and contagion, it is generally believed that they are properly depressing or sedative,—but of this it is difficult to advance positive proof. We know as little of the modes of action of these morbid influences, as we do of their immediate and primary effects, or of the intimate nature of incipient febrile disorder. Some of them act probably upon, and through the skin as malaria, and perhaps, the contagions. This we infer from the less liability of the darker colored races of men, and especially of negroes to some of them, and from the protection afforded by wearing garments of woollen cloth. Dealers in oil are said in eastern countries to escape the plague. Hence was derived, we suppose, the ancient custom of anointing the body, still retained among some half civilized and savage nations.

The lungs may also afford an inlet especially to those which act primarily on the blood. Nor would I deny altogether the liability of the mucous membrane of the digestive tube to receive the earliest impressions of febrific agents—a point recently so much labored by the French or physiological school of pa-

thologists, though I will avow that it appears to me the least obvious and most indirect of all the modes of invasion yet suggested. This tissue must be already in a morbid condition to be affected by the ordinary articles of food and drink; and as to the admission of ærial poisons diffused in the atmosphere, the opportunity must indeed be slight, if it depend upon mixture with the saliva, so little of which is usually swallowed by persons in health.

We may conclude here this brief discussion of the general subject of fever, with an enumeration and cursory description of its consequences, or the effects of febrile disorder upon the several organs of the body assailed in its progress, as manifested in examinations post mortem.

The brain rarely fails to present the signs of vascular engorgement, and very often shows the results of inflammation in greater or less degree either of its substance or membranes. This occurs so generally that inflammation of the brain and membranes is considered by a pretty numerous class of physicians with Clutterbuck at their head, as the true proximate cause of fever. Numerous facts have been brought forward to establish this conclusion, which has been very plausibly advocated, and much ingenious reasoning employed to explain away the difficulties and exceptions adduced by its opponents.

Analogous marks of lesion in the mucous membrane of the stomach and intestines, have occasioned this tissue to be in a similar manner selected as the seat of an inflammatory irritation alleged to be the proximate cause of fever, or rather fever itself, for such is the doctrine of Broussais and his followers. Nor do the other abdominal and pelvic viscera escape during the tumults of this pervasive malady; though as we shall hereafter inform you more in detail, they exhibit these disturbances rather in derangement or suspension of their functions than in any material alterations of structure. Yet we can observe occasionally not only engorgement but inflammation with its results in the liver, spleen, kidneys and bladder.

The respiratory organs also suffer in fever, though not so generally or in so striking a degree as the viscera above spoken of. Pulmonary congestion is often one of the early symptoms

of the attack, but in a majority of instances it undergoes a spontaneous solution during the successive changes of action and determination.

It is admitted that these local febrile affections are usually of the nature of inflammation, or display an almost irresistible tendency to run promptly into that condition. The opinion certainly derives strong support from the phenomena exhibited in fatal cases of protracted duration. In these we almost invariably meet with inflammatory disorganizations. On the other hand, it is contended that these are incidental and not essential results, as they are not found to take place in the most violent attacks if they terminate unfavorably after a brief course. Here no lesions are discoverable. In still more numerous instances we find the determinations to and affections of particular parts to be clearly and simply congestive, and these are among the most mortal and malignant of febrile modes of derangement. Still farther, it seems to me reasonable to regard many if not most of the determinations that occur in the course of an ordinary attack of fever as simply irritative, in contradistinction to inflammatory and congestive conditions of parts. The numerous head aches, spinal and muscular pains, and gastric oppressions and annoyances connected with fever at particular stages or periods, subsiding rapidly and often disappearing altogether when these stages are past, are, I should think, clearly of this character. In different seasons, climates and localities, and in different types of fever, we find these several local affections differing notably. Some of these variations appear to be incidental, while others are uniform and essential, occurring in masses and showing little respect to individual peculiarities of constitution.

We are much assisted in forming an idea of the comparative liability of the several organs to febrile lesion, by an examination of the instructive tables published by the physicians in attendance upon certain large hospitals. Three of these I copy, as follows :

Crampton, in his history of an epidemic fever in Dublin, gives an estimate of the relative proportion in which the different organs were affected :

Out of 755 cases

550	showed injury of the brain and its membranes.
129	“ “ of the thoracic viscera.
76	“ “ of the viscera of the abdomen.

755

Southwood Smith, of the London Fever Hospital, gives a table of what he styles the “proportions of internal characteristic affections.”

Out of 300 cases

79	were thoracic.
66	“ cerebral.
60	“ abdominal.
95	“ mixed.

300

Dr. Tweedie, a writer of high respectability, publishes in the Eng. Cyc. of Prac. Med., the following precise and definite statement:

Out of 521 cases—(likewise in the London fever hospital,)

114	were complicated (as he phrases it,) with cerebral affection.
103	were complicated with thoracic affection.
71	“ “ “ abdominal “
26	“ “ “ cerebral and thoracic affection.
30	were “ “ cerebral and abdominal affection.
14	“ “ “ cerebral, thoracic and abdominal affection.

While 163 were simple or uncomplicated with any local infection or lesion.

521

I regret to say that I am not able to offer you any exact tables of this kind kept in our own country and climate. I have, however, made and been present at very numerous autopsies, of which I have carefully preserved notes, and believe myself warranted in affirming that the proportions, as stated in the above table, are here entirely reversed.

Here we find a majority of the lesions presented, in the viscera of the abdomen. The mucous membrane of the stomach and intestines very rarely escapes injury in cases protracted to any length.

The next greatest number is of the cerebral affections, and these are met with in attacks that prove rapidly fatal, and such as run into a typhous state. Comparatively few lesions of the pulmonary organs take place in our genial climate, and though not absolutely confined to the winter season, usually occur during cold weather.

CHAPTER IV.

IDIOPATHIC FEVER—INTERMITTENTS.

IDIOPATHIC fevers are divided into the intermittent, remittent and continued, of which I proceed to treat successively, and in order as I have named them.

The Intermittent consists of a series of febrile paroxysms, separated from each other by distinct intervals of apyrexia.

The Remittent, as its name imports, does not present any interval absolutely apyretic; it is characterized by the occurrence of definite periods of abatement, or diminution of the febrile symptoms, followed by a return or aggravation of them.

Continued fever has been denied a separate existence. It is perhaps difficult to imagine a fever so equable in its course, and steadily continuous, as that it shall offer no variation in the degree of violence of symptoms from time to time; yet there is such an obvious and well marked difference between the occasional and uncertain occurrence of such abatement, and the regular, calculable and characteristic remissions of our second class, that I do not hesitate to recognize the distinction. It appears to me, indeed, as difficult to confound the types of the ordinary remittent fever of our climate and of typhus, as it would be to mistake a quartan for a bilious remittent.

The intermittent has been supposed by some to be the primary type, from which each of the others originates, liable to certain complexities and modifications. This idea is by no means destitute of plausibility. I shall hereafter point out the relations between the remittents of our climate and the varieties of the tertian. Thus too the quotidian has been considered the source of the continued fevers—and if we pursue the analogy, we shall be able to shadow forth a vague and indefinite relation of critical days to the quotidian in the first week, the tertian in the second, and the quartan in the third. Nor need we stop in these our fanciful calculations, until we have traced all these periods of exacerbation, remission and crisis to diurnal and septenary revolutions, and these to the influence of the sun and the moon.

INTERMITTENT FEVER.

The paroxysm of an intermittent consists of three stages, the cold, hot and sweating—the first of which may be regarded as the invasion—the last, as the solution of a febrile attack.

At the commencement of the cold stage, the patient is affected with a sense of languor and muscular weakness, yawns, stretches, and perhaps sighs frequently; his face is pale, his lips bluish or livid, and his features are shrunk. The feeling of cold commences along the course of the spine, as if water were trickling down his back; the extremities are next affected, and the sensation soon extends over his whole body, becoming often so intense as to occasion corrugation of the skin or “rigors,” and chattering of the teeth. These symptoms are attended with tremulous shivering of the body, gastric oppression and nausea, and often with headache and spinal and muscular pains.

When they have lasted for a certain length of time, flushings of heat begin to alternate with the rigors—the uneasiness of stomach increases to vomiting, and finally the sensation of heat predominates, and the second stage supervenes, with turgid features, red and watery eye, restlessness and thirst. The pulse which was at first contracted, and apparently feeble, now becomes full, hard and bounding. The matters vomited—after the stomach has been emptied of its accidental contents, consist

of a mixture of mucus with vitiated bile. The duration of this hot stage varies according to circumstances—but at length a moisture is thrown out upon the forehead and breast, which progressively extends over the whole body; and the sweat flowing freely, all the symptoms subside, and are soon entirely relieved.

Such is the ordinary history of the paroxysm of an intermittent, but you will meet in reading and practice, with many irregularities and anomalies. It is not uncommon for example, to see intermittents without any rigor or cold stage; and some cases of considerable protraction, have preserved this peculiarity throughout their whole course.

The books tell some strange stories of these anomalies. Instances are recorded in which the hot stage was known to antecede the cold; nay, one is given from Schenck, in which the usual order of the paroxysm was completely reversed, and the sweating stage took precedence.

Much is said by authors of what they term masked or disguised intermittents, in which all the usual phenomena of the febrile paroxysm are absent, and others substituted in their stead, by means of some inexplicable association. It is urged as a matter of great importance to discern and distinguish such cases, as the proper treatment of intermittents is alone capable of effecting their cure. A pain in the eye, in the head, the abdomen, in one limb, etc. has been observed to recur at regular intervals, and to bid defiance to any other mode of management. It is farther alleged that those attacks are occasioned by the specific cause of intermittents, malaria namely—or paludal miasmata. Granting, however, what I am by no means disposed to question, the identity of the cause producing them with that of intermittents, I am still doubtful of the propriety of classing them under this head; but would prefer to regard them as affections of the parts in which they show themselves, presenting in addition to their usual symptoms the remarkable one of periodical recurrence. We shall find the catalogue of malarious diseases to be far from a short one, and even where this obscure but powerful agent has not been, to speak correctly, the efficient cause of any disease, it may impress the attack with the character of periodicity either by direct modification, or by the constitutional predisposition it has generated.

But periodicity itself is not so rare a circumstance in the history of diseases as to require that we should refer such as manifest it, to the head of intermittent fevers on that ground exclusively. All classes of disorders may assume a periodical regularity. In 1821, there was a man in our alms-house, whose case was looked upon as a "masked intermittent," in whom the only symptom of the access of the paroxysm, was the regular recurrence of a quasi hysterical disposition to laugh and cry. In 1826, while attending a little girl, her ordinary febrile symptoms disappeared, and a regular attack of colic was substituted, coming on every alternate evening, and continued throughout the night. Epilepsy, asthma, headaches, etc. are met with thus modified, and I shall have occasion to mention an affection of the frontal sinus and antrum which I have seen several times connected with catarrhal fever or influenza, of the most obstinate periodical character. Nor do I yield the assumed weight to the argument that these maladies require and are best controlled by the remedies for intermittent fever. I do not regard these remedies as specific or exclusive; on the contrary, they are of very extensive application and suited to a very wide range of diseases.

Intermittents are subdivided in reference to the periods of time occupied by the febrile exacerbations and their intervals—thus the Quotidian completes its revolution in about twenty-four hours; the Tertian in about forty-eight hours—the Quartan in about seventy-two hours.

They are distinguished also by corresponding differences in the ordinary time of accession and in the usual duration of the paroxysm—as well as in the relative duration of its several stages.

The quotidian has the shortest cold fit—its access is early in the forenoon—the paroxysm chiefly consisting of the hot stage, is longer than that of the others, being nearly or quite eighteen hours—the apyrexia is of course short.

The tertian commences usually at or about mid-day, and lasts something less perhaps than twelve hours.

The quartan has a long cold stage, but the paroxysm is a short one, coming on in the afternoon or evening, and lasting about nine hours.

Intermittents are noted for the manifestation of a strong tendency to recur, fixing themselves on the constitution with all

the tenacity of habit, and resisting for great lengths of time every effort to expel them. The quartan is most remarkable for this obstinacy. I have myself known it to continue for fifteen years, and instances are recorded of its duration extending to twenty, twenty-four, and, as Good states, even to forty-eight years.

The above are the simple or original types. They are variously complicated, or rather divided and multiplied, for they never run into each other: with this single exception, that any one of them may degenerate into the quartan. The double tertian and triple tertian are well known. The former is distinguished from the quotidian by the time of access and duration of the paroxysm—and still better by the fact that there is little or no correspondence between successive attacks, but a notable resemblance between the phenomena of alternate paroxysms. Thus, the history of the first and third days, and of the second and fourth, correspond precisely.

This correspondence of alternate paroxysms extends sometimes to the minutest particulars. It will not only be shown in the hour of invasion, and the violence of the symptoms and their duration, but in the organs affected by determination of vascular excitement. In November, 1833, I had under my care a case strongly in point. A gentleman came hither from Darien, Georgia, who had been for some weeks suffering under severe bilious remittent, which subsiding, left behind it an obstinate intermittent of marked double tertian type. On the first and third days and so on, the paroxysm invaded about eleven, A. M., with a harsh rigor, with determination to the stomach, nausea, etc. On the second, fourth and sixth there was no chill; fever supervening with the hot stage in the afternoon.

There is also a triple tertian, of which I shall say more when we come to treat of bilious remittent, to whose exacerbations its paroxysms often bear a clear relation. It consists of three paroxysms, two of them occurring regularly on alternate days, with a single one on the intervening day. Each of these paroxysms, if noted carefully, will be found closely to resemble in all points its correlative, and may differ very widely from each of the others. The books tell us of a double quartan, which I have never met with, and of a semi quartan, which I am very much disposed to regard as hebdomadial and ascribe to the influ-

ence of the septenary revolution. I have seen a few instances of this sort; it is called by the common people "the eight-day fever and ague."

Cause of Intermittents. This class of febrile affections is almost universally attributed by the moderns to the impression of malaria exclusively. Other agents, to which their occurrence was formerly ascribed, are now regarded rather as merely predisposing, such as fatigue, anxiety, poor diet, moist air, etc. Additional efficiency is given to the influence of miasmata, by sudden alternations of temperature, exposure to cold and getting wet, as in the chilling night dews of warm climates in autumn, and the heavy rains of that season. It is true, however, that some recent writers have attributed to these subsidiary influences the absolute power of generating intermittent independently of malaria. Yet none of the cases alleged as the foundation of such opinions, can for a moment be regarded as decisive. The intermittents of London, of which James I. and Oliver Cromwell died, and which have occasionally attracted the attention of the profession from Sydenham's time down to 1828, are summarily accounted for by McCulloch on the received principles. Cases apparently exceptions which are given us by Andral also, as occurring in Paris, may be reasonably attributed to the ordinary sources. The great number of cases occurring in our immediate region are secondary, being consequent upon protracted attacks of the ordinary bilious remittent of our climate.

The consequences of intermittents vary with their violence and duration. In some localities, as on the coast of Africa, a malignant modification of this type of fever is met with, which often proves promptly fatal by the congestive determination which affects the vital organs. Examples of this sort are even met with in temperate climates, though very rarely. In general they are tenacious rather than mortal. But it is not to be supposed that such concussions can be repeated without the most serious injury to the constitution of the patient. Accordingly we find his health often irreparably injured by the lesion of some important organ, and death slowly ensuing from consequent impairment of its functions. Most of these evils seem to depend upon the congestions characteristic of the cold stage. Hence we have enlargement and induration of the spleen and liver,

which give rise to a long train of maladies affecting the digestive and circulatory systems, dyspepsia, jaundice, hepatitis, dropsy.

Dysentery is mentioned by Robert Jackson as the most prominent result of the cases occurring in the English army which infested South-Carolina during the war of the revolution, and gained the suicidal victories of Camden and Eutaw.

I should not omit to allude to a curious, and so far as I know, singular exception to the disposition of these congestions to effect the internal organs. We have in our museum the preparation of a penis which suffered during a protracted attack of intermittent, the same or analogous engorgement, enlargement and induration which usually derange the spleen in agues, being obviously the seat of the congestive determination familiarly taking place to that viscus. They possess, as you know, an erectile structure in common. The case occurred in our alms house, and was witnessed by a large number of physicians, none of whom, I believe, entertained any doubt of its nature.

The general Prognosis in intermittent fevers is favorable, with some allowance for their tendency in all seasons and climates to obstinate protraction, and in hot and moist climates to malignant violence. Vernal intermittents are every where more curable than the autumnal. I have mentioned the mortality of the African intermittents. In England and Holland, they are attended with little danger. Here also, they are for the most part, easily manageable, yet not without some risk both of immediate and ultimate ill effects.

Particular Prognosis. The favorable symptoms are, ready solution of a paroxysm by sweating, and completeness of the apyrexia; entire freedom from local ailment during the interval; postponement of the expected period of access; and diminution of violence in the invasion. On the other hand, an imperfect apyrexia; the pertinacity of some of the local pains brought on by the paroxysm; anticipation of the time of approach; intensity of cold stage and other symptoms of congestion; violence of determination to important organs, in the hot stage, as to the head and stomach, are unfavorable signs.

The Treatment of intermittent fever is reasonably and naturally divided into that which is necessary during the paroxysm, the palliative and protective; and that which is proper to be re-

sorted to in the interval—the preventive or alterative. Some modification is required too in reference to the opposite conditions which may attend; the attack being sometimes typhoid, though usually inflammatory, to employ familiar and significant technical phrases.

In the latter form, which is infinitely the most common among us, we are not much in the habit of interfering during an ordinary paroxysm, farther than with the view of merely lessening the violence of its prominent symptoms and shortening its duration.

To abbreviate the cold stage—to diminish the vascular excitement during the hot stage, and to induce its prompt resolution by sweating, are the objects of the practitioner. From time immemorial, it has been supposed that the history of the paroxysm and its results would bear a direct relation to, and correspondence with, the intensity and duration of the rigor. Hence the anxiety to put an end to it at once, before it has brought on the internal determinations, congestions and debility that certainly attend it, and are so plausibly ascribed to its morbid influences upon the constitution. To effect these purposes, it is usual to begin at its earliest commencement, with the assiduous employment of stimulants, both externally and internally. The patient is wrapped in blankets—hot bricks and bottles of hot water are laid to his extremities, and warm poultices with mustard applied to the epigastrium. Warm drinks are given as freely as the stomach will bear, sometimes mixed with cordials and diffusible stimulants. We thus restore the warmth of the surface and the centrifugal distribution of blood in the extreme vessels of the skin, relieving the heart and large vessels of the head, the thorax and the abdomen, from the centripetal oppression under which they must labor.

The same results are said to be brought about mechanically by placing tourniquets upon the limbs. The proposer of this plan, Kellie, declares it to be uniformly successful in bringing on promptly a mild hot stage. He supposes it to act by obstructing the downward flow of arterial blood, which being thus thrown back upon the heart, excites it to more vehement and ready re-action. Others attribute its good effects rather to a stoppage of the return of venous blood, “which, being confined,”

says McIntosh, "in the extremities," at least so much of the "congestion in internal organs is prevented." The same author quotes Dr. Foot as stating that "some Persian physicians apply ice to the surface of the body in the cold stage of intermittents with good effect," and, in India, he tells us, the cold affusion is also employed under similar circumstances. But he surely argues illogically when he infers that he finds here a confirmation of the view taken by him of the *modus operandi* of the tourniquet. Neither the cold affusion, nor the ice, have any perceptible tendency to detain blood in the cutaneous veins, while they obviously repel it from the small cutaneous arteries, thus acting, as Kelly imagines the pressure of the tourniquet to act upon the large arteries.*

This instrument has obviously the advantage of greater safety in the cases of debilitated patients. Cold applications are only admissible when the subject is young and vigorous and the powers of re-action unimpaired. In opposite conditions, the danger is too obvious to be dwelt on.

McIntosh conceiving, like Cooke of Transylvania, that the cold stage, with all its circumstances and results, depends upon what the latter calls "venous congestion," a determination of blood to the large viscera and its congestive detention there, advises to assist the re-active disposition and operations of the system by venæsection, promptly and freely resorted to. He conceives the lancet to act beneficially by immediately soliciting the free distribution of blood, and thus effecting a solution of the oppressive congestions. "The patient is suddenly relieved," he tells us, "from pain, breathes freely; the tremors become slighter, soon ceasing altogether, and with them vanishes the sensation of cold. If he be now properly managed with respect to the bed clothes," we are assured, "neither hot nor sweating stage will follow. Most of his patients have fallen asleep immediately after the operation, but some of them have got up and dressed themselves." These statements are confirmed by the concurrent testimony of several physicians quoted in his work on the Practice of Physic.

* The subject of hemostasis, in all its relations, is well treated of by Dr. Buckler, of Baltimore, in an ingenious essay originally published in one of our periodicals, and preserved in the 7th vol. of "Braithwaite's Retrospect."

I have had no experience with the expedient thus proposed by Dr. McIntosh, and am therefore perhaps scarcely entitled to pronounce upon its merits. Intermittent fevers are not in my hands fatal, dangerous, or unmanageable, although sometimes disposed to be obstinate, and I have not been tempted to resort to a measure apparently doubtful in its influence, and in particular circumstances involving obvious risk. Stokes says, that he had made trial of Dr. McIntosh's practice of "venæsection in the cold stage, on not less than one hundred patients." His conclusions were, that in general it is not unsafe; "in many cases, it ameliorated the character of the paroxysms;" in some, "had the effect of completely arresting the disease—but this last is a rare occurrence;" this favorable termination "did not happen in more than three or four." He saw some cases in which the cold, and others in which the hot fit "were rendered more violent; and several in which the paroxysms were made to anticipate or were brought more closely together." Gill says, that he could convert many cases of intermittent into continued fever by bleeding in the cold stage.

According to my own observation and opinions, opium is the most important remedy in the cold stage of an intermittent. It may be given in various modes and quantities. I am in the habit of prescribing it at the earliest moment of invasion, or even in cases of regular occurrence a little while previously—in full dose, and most generally in combination with camphor. It seems to me to exert a double influence upon the sensorial and vascular system as a stimulant narcotic. I do not doubt, that I have often seen it cut short or prevent the cold stage, sometimes inducing a pleasant sleep, without febrile symptoms of any kind—sometimes bringing on a mild, hot stage, promptly resolved by copious diaphoresis—an indirect effect of both these powerful medicines. To Drs. Trotter and Lind belongs the merit of introducing this practice, which is highly worthy of your confidence.

The familiar domestic custom of administering an emetic immediately before the expected accession of the paroxysm, or at its coming on, may prove eminently adapted to cases connected with great depravation of the secretions; as shown by foul tongue, fœtid breath, sallowness of the visage, oppression of stomach,

etc. Ipecacuanha is preferable, but if not sufficiently active, may be combined with some more energetic article of the class. I should caution you, however, against the frequent repetition of emetics, which, in unskilful and inconsiderate hands, have done much harm. Avoid them altogether, unless the indications for their use are clearly traced.

The hot stage coming on, a very different plan of management is required. In general, it is not necessary to do more than palliate the symptoms of excitement that show themselves. The head may be kept cool by towels wet with cold water; the thirst relieved by draughts of some refrigerant, or, if the stomach be irritable, with pellets of ice; the chamber kept dark, and cool, and silent. When the sweating stage commences, a slight comfortable covering should be drawn over him, and he may then be left to his repose.

In cases of more than ordinary violence, however, we may be called on to interfere more actively to protect the organs assailed from injury either immediate or ultimate. If there be undue determination to the head, the chest or the abdomen, and the pulse be hard and full, you will find much advantage in blood-letting, especially in the early paroxysms, and in young and robust subjects; under different circumstances resort to it cautiously, if at all. Other revulsives and sedatives must be employed. Administer a quick saline cathartic, which aid promptly by a large enema. Lay a mustard poultice to the abdomen, if there be gastric disturbance, and irritate the extremities by similar applications, while cold affusion is made to the head, if the seat of pain.

The cold bath is often one of our most useful remedies at this point of time. Nothing abstracts more from the irregular violence of vascular action. It relieves the burning heat of the surface, calms the disturbed stomach, and quiets the throbbing head, and frequently brings on at once the solution of this distressing stage of the paroxysm by sweating. It is not adapted to the cases of old and infirm people, and must be avoided as likely to do harm where there is any pulmonary affection, and where diarrhœa exists.

Dr. Lind recommends the use of opium even in the hot stage of intermittents, asserting its beneficial effect in shortening it, as

well as in abating the severity of its symptoms—in bringing on a salutary diaphoresis, with tranquil sleep, and procuring a complete apyrexia. I do not object to the exhibition of the remedy in chronic and habitual attacks, or those which we meet with in old and infirm subjects.

In such cases, I have seen it admirably useful. The best formula for its exhibition is the Dovers powder, which it may be well to combine with a grain or two of calomel, or a little rhubarb, to prevent constipation. I would caution you, however, to avoid this practice in recent attacks, and in those presenting any marked inflammatory determination, especially if to the head.

I have said that intermittents sometimes (though with us rarely,) assume a typhoid character. These are characterized by special prostration of muscular strength and vascular action; there is usually dyspnœa with livid and anxious countenance, the lips are bluish and the nails and tips of the fingers deeply discolored; there is low and muttering delirium, and extreme mental dejection and alarm.

In such paroxysms your resort to the highest order of stimulants must be prompt, decided and persevering. Brandy and æther must be administered with laudanum in no timid doses, while mustard and capsicum are applied extensively to the surface, both of the extremities and the trunk. To these external irritants heat will give added effect, and some have advised not only the use of bottles of hot water and hot bricks, etc., but even of frictions with hot turpentine and of flannels wrung out of boiling water. Stimulating enemata are also serviceable; they may be composed of ardent spirits or aromatics, as ginger tea and the like, or of capsicum and turpentine. These may appear to you to be harsh remedies, and indeed nothing could justify their enumeration but the absolute hopelessness of the case under any milder management. Nay, you will be fortunate indeed, if you never meet with examples of protraction and torpidity too profound to be affected even by these irritants, acrid as they are when applied to natural surfaces.

Should reaction happily take place, and the feeble fluttering pulse become fuller and stronger, diminish the vehemence of your remedial applications, and employ the more manageable in

preference. The cordial and stimulating diaphoretics, such as camphor and the vol. alkali, may be combined with alcoholic preparations, or with wine whey; and such doses administered as the symptoms require, and persevered in as long as the enfeebled condition of the patient shall demand their support.

Next we proceed to consider the treatment proper during the apyrexia or intermission. Nothing is better known than the difficulty of preventing the return of these forms of fever, when once they have had time and opportunity to fix themselves upon the constitution; but perhaps the best proof of this their characteristic obstinacy, and of the uncertainty of each of our remedies, will be found in a reference to their immense number and variety.

We shall often succeed in the prevention of an expected recurrence of intermittent, by the use of any means, whether physical or moral, by which we may make a strong impression on the system of the patient, however transient it may be. We gain in this way an obvious advantage by interrupting the train of habitual morbid actions, and thus breaking up a series of successive determinations to organs morbidly affected.

Emetics are much used with this view, and unless contraindicated by some peculiarity in the condition of the stomach, certainly deserve a trial. They should be administered just when the calculated hour of invasion is at hand.

Opium, by exciting a new and forcible movement of the organs of circulation, sensation and thought, or by putting the patient to sleep profoundly, substitutes an incompatible state of the body, and prevents an attack. It is very rare to find a paroxysm of intermittent invade a patient when asleep. I have, indeed, heard of but one such instance. Many prefer, for this purpose, to combine it with the more diffusible stimuli—alcohol, æther, ammonia, etc. Any stimulant, indeed, is capable of similar beneficial effect. Dr. Heberden relieved a patient, he says, of an obstinate ague, by giving him myrrh in large dose *zij.* just before the cold fit. Capsicum and camphor are also employed.

External irritants produce like results, provided they can be made to act intensely enough, and at the proper moment. A very painful blister, or a number of sinapisms, will answer this purpose. On the same principle, of exciting a strong counter-

impression on the body through the mind however, we explain the vulgar practice of offering the patient just before the paroxysm something specially revolting and disgusting; reptiles and vermin either crushed together or in a living state to be swallowed. Thus also in old habitual cases, the pushing forward adroitly the hands of the clock upon whose dial the patient was accustomed to watch the progress of time, and the approach of the paroxysmal period; thus deceiving him into the confident belief that the dreaded hour had past by, has been actually known to effect his escape from the looked for attack.

If by any such means, we procure an exemption from a regular paroxysm, and protract the interval to double its usual length, we gain much, as I have already said, by thus interrupting the successive series of organic concussion and derangement; the obstinate predisposition to recur is somewhat diminished; the tenacious precision of this punctual tormentor somewhat shaken.

A better opportunity is now offered for obtaining the effect of another class of remedies, which we may designate as the alterative or preventive; to which indeed, though slower and perhaps somewhat less immediately impressive than those already enumerated, we must ultimately look for a radical and permanent cure. Of these remedies we now proceed to treat; and the first place among them is universally conceded to be due to cinchona or the peruvian bark. For many generations back, the reliance of the profession has been chiefly placed upon the administration of this medicine, in some mode or formula, and the skill of the physician almost exclusively directed to prepare the patient for it and to superintend its exhibition.

The discovery of cinchona forms indeed an era in the history of the healing art; and the reputation which after many reverses and much opposition it has finally obtained and long supported, is deservedly of the highest order; there are few articles on the extended catalogue of the materia medica, so fairly and fully entitled to our confidence. Yet the claims which we thus acknowledge must not be admitted without due reserve and reasonable qualification. The bark is by no means an infallible remedy, as some have maintained, not even under the most favorable circumstances. Nor is it, as is so often taken for granted, applicable promiscuously or in all cases; on the contrary, its use is in some

instances absolutely prohibited, and limited by a variety of conditions.

Thus you will hardly venture upon the exhibition of cinchona, when the apyrexia is imperfect, and where there are present obvious marks of local disorder of some important organ. The continuance of headache, gastric oppression, abdominal pain and tension—these symptoms demand farther general or preliminary treatment. Local depletion by leeches or cups, applied in the vicinity of the part most prominently affected; counter-irritation by sinapisms or vesicatories; a gentle emetic perhaps or a mild purgative may be required. If there be pulmonary disorder, anodynes and diaphoretics should be employed. If painful engorgement of liver or spleen, a slow and gentle affection of the system by a mercurial course will be useful. The obstacles to its efficacy thus alluded to being removed, and a perfect apyrexia obtained, we may expect the full benefits of cinchona. Since the discovery of the active principle contained in it, kina or quinine, and its extraction by the processes of analytical chemistry—which we may safely pronounce to be the greatest improvement in modern pharmacy—the crude bark of the shops is little used. One of the salts of this alkaline principle is now almost exclusively employed—the sulphate namely, which in smallness of bulk, certainty and uniformity of dose, and freedom from every offensive quality except mere bitterness, is admirably adapted to our purposes. I have rarely occasion to prescribe a greater quantity than from one to three grains, which I repeat at an interval of an hour or two throughout the apyrexia, preferring the solution in water, made with the aid of sulphuric acid. It is now very common to rely, rather upon one large dose given a short time previous to the expected access of the paroxysm; and our southern and south-western brethren are in the habit of exhibiting in this way, very extraordinary amounts, and as we are told, not only with safety but with prompt advantage. A scruple is given not unfrequently, at once—nay, thirty and fifty grains, and I have heard of instances in which one hundred grains have been swallowed in twenty-four hours. I know of no evil results from this mode of treatment, which some both in Europe and our own country have stigmatized as dangerous in its influence upon the brain and nervous system. I have not found it neces-

sary to resort to it, meeting with no difficulty in attaining my object by perseverance with more moderate doses.

You may, however, occasionally choose to recur to the more ancient mode of administering cinchona. The powder will seldom be willingly taken or well borne. Wine is the best vehicle for it, and is indeed itself an excellent tonic, when sound; and well adapted, when there is present a notable degree of debility.

The infusion of cinchona is still prescribed, now and then, as affording convenient opportunity for useful combinations. Mingled thus with serpentaria, and rendered aromatic by impregnation with camphor, it is especially grateful to many patients, and will be found a cordial tonic and diaphoretic.

Bark is also employed occasionally in tincture—which may sometimes be added with advantage to the infusion, but cannot be given to any purpose alone; in enemata—in baths—and worn in quilted jackets. For endermic medication the sulphate of quinine is much to be preferred, and exerts considerable efficacy when applied upon a blistered surface.

Piperine, a peculiar principle extracted from the black pepper of commerce, deserves to be spoken of in the next place. It is, undoubtedly, possessed of extraordinary power to interrupt the progress of an intermittent, whether by any specific inherent febrifuge property, I will not affirm. It is decidedly stimulant—too much so to be applicable to the great majority of cases, or to be depended on alone. I am accustomed to use it in combination with the sulphate of quinine, which I prescribe throughout the apyrexia, at intervals, as I have stated to you; and just before the period of expected access, I add the piperine, giving one or perhaps two doses of the latter an hour and a half and half an hour before the invasion. The dose of piperine which I employ is one grain, and from this quantity, in the combination just dwelt on, I have obtained the most gratifying and unequivocal results, having succeeded with it in the most obstinate and protracted cases. No domestic remedy enjoys a higher reputation here than the vinous tincture of sage, made by pouring into a bottle, as full as it can hold of the leaves of fresh sage, good port wine, thus producing a saturated infusion, of which a wineglassful is a dose—taken thrice a day. Many obstinate and

protracted cases in our low country have been promptly cured with it.

Narcotine—or rather the muriate of narcotine—one of the principles contained in the invaluable juice of the poppy, has been extolled by O'Shaughnessy and other East-Indian physicians, as very serviceable in the treatment of intermittent fever. It is, doubtless, a good addition to our long list of remedies. In ordinary cases it is not an available substitute for the sulphate of quinine, which is vastly more efficient; but in many modifications of condition which offer objections to the better remedy, it will be found of use. Like quinine, too, it seems adapted to the management generally of paroxysmal and recurrent maladies.

Sulphur is a well known and exceedingly valuable remedy for intermittent fever. In power it is not greatly inferior to cinchona, even when the latter is best adapted—and it has this advantage, that it may be administered without hesitation safely and properly, in an extensive variety of cases, when the bark is contra-indicated and likely to do harm rather than good. Sulphur has been used in the treatment of a long list of periodical maladies, and is considered an appropriate prescription in all anomalous cases, such as come under the head of masked or disguised intermittents, head-aches of regular recurrence, periodical pains in the eye, etc.

Bark, in all its modes of preparation, even the sulphate of quinine, is generally regarded as inadmissible whenever the apyrexia is notably incomplete, and when there are any prominent affections of important organs. To such cases, fortunately, sulphur is perfectly well adapted, and in such I have often found it productive of the most obvious and lasting benefit.

It directs its own operation by the skin and the bowels, and hence is not likely to give rise to any deleterious consequences, unless urged by inordinate increase of dose, when it becomes an irritating purgative. Of this extreme abuse of it, I once met with a striking instance. An exploring party was sent some years since, by an association of Northern speculators into the rivers of Florida to examine into the facilities there presented for the cultivation of coffee, sugar, olives, etc. Most unaccountably this expedition was undertaken in summer, and, of course, every in-

dividual of the party was sooner or later attacked with bilious remittent of serious grade. Their physician was a young man whose sole reliance was upon the mercurial treatment. He salivated them all freely, and thus subjected them to extreme inconvenience, especially as they were much exposed both at sea and on shore. In his anxiety to relieve the convalescents from ptyalism, and perfect their recovery from fever, he resorted to sulphur, which he gave them in the almost incredible dose of a tablespoonful every hour or two. It produced the most violent pain and irritation of the bowels, diarrhœa and dysentery, and in the greatest distress they put into our harbor, where several of them, the commander and the physician among the rest, became my patients. I am glad to be able to add, that none of them died.

Dr. Grainger, of the British army, found sulphur, he tells us, the best cure for the intermittents of the pestilential island of Java. It is customary for the captains of American vessels, in those unhealthy ports, to give it freely and regularly to their men during their stay, as a preventive, and the practice is said to be successful.

It forms, in combination with cinchona, in powder, one of the most efficient preparations I have ever employed in the management of intermittent fevers, and is very extensively adapted to the modifications and irregular complications we sometimes meet with. I prescribe the proportion of about ʒss. of cinchona to 10 or 18 grains of sulphur, repeated every third or fourth hour, taking care not to irritate or disturb the bowels with colic or diarrhœa.

There remain a host of minor articles, comparatively speaking, which the industry of physicians, and the observations of authors and of the common people, have brought into use as remedies for intermittents. They may be arranged under the heads of bitters, astringents and mineral tonics. Under the first we may mention the bark of willow, from which salicine has been extracted—a principle analogous to quinine, and though undeniably useful, yet by no means deserving of the confidence we place in that powerful drug. The dogwood bark has also yielded, in small quantity, a similar extract, cornine, highly eulogized by those who have employed it. The infusion is also regarded as possessing some febrifuge value.

The common poplar was thought by Rush little inferior to

cinchona, but has now fallen into disuse. Quassia, gentian, carduus, are also forgotten. Among astringents, our oaks, mahogany, kino and alum, have all of them been found efficacious in particular instances. Of the mineral tonics, arsenic, notwithstanding the doubts of some authors, merits to be considered the principal. It is, however, one of the class of heroic remedies, and requires to be cautiously administered and attentively watched. We are often tempted to make use of it with children and indocile adults, on account of its inoffensiveness and ready susceptibilities of disguise. Hence, it forms a frequent ingredient in patent and secret medicines or compounds. It is best exhibited in combination with alkali and in a liquid form, as in Fowler's solution, and in small dose, not more than from 3 to 10 drops thrice a day. It seems to be singularly successful in the extirpation of the most chronic cases—obstinate habitual quartans. The case of fifteen years standing mentioned to you, was cured by a persevering use of Fowler's solution. Like sulphur, it has been found adapted to the treatment of an extensive catalogue of diseases of a periodical or paroxysmal character. You should be on your guard to detect the morbid effects of arsenic when prescribed. They are, an unpleasant sensation at the pit of the stomach, a pale swelling of the eyelids, face and extremities. When these appear, it is prudent to intermit for some time the use of arsenical formulæ, although MacCulloch affirms that no augmentation of the unpleasant symptoms just recounted is occasioned by perseverance in the same moderate doses—nor, indeed, any other consequences which need be dreaded. I advise you, nevertheless, to beware and desist—nay, more, I would have you regard this article of the materia medica as one of dernier resort, only to be employed when the milder and less suspicious have failed.

The preparations of iron are in very general use, and are much esteemed. The carbonate is extensively employed by Elliotson of London. It is supposed to be especially serviceable in anomalous cases and in masked and disguised intermittents, among which neuralgia has lately been classed as a kindred affection, arising from the same cause, malaria. The prussiate is highly lauded by Eberle and others. It is convenient in the management of wayward children, as it is tasteless and inodo-

rous. I do not regard it with any confidence, as I have been more than once disappointed by it.

The salts of copper—of bismuth, and of zinc, have each, in turn, received favorable notice from writers on the *materia medica*. I cannot consider any one of them as of much value in the treatment of intermittent fever. The sulphate of zinc is said to be widely employed in the fens of Lincolnshire in England. The dose is 1 or 2 grains, three times a day, in combination with capsicum, which indeed I conceive to be the more efficient of the two.

I must not omit to speak briefly, before I conclude, of a few articles which do not come under either of the above heads. Charcoal is highly recommended by Dr. Calvert, and is said to be much employed in Sicily. I have never trusted to it alone but it forms a beneficial combination with cinchona, when the stomach and bowels are torpid, with foul tongue, sallow visage and foetid breath. Animal gelatine was first prescribed by the British physicians, in the form of common glue. We cannot wonder that as soon as chemistry had ascertained the absolute identity of the two, this nauseous formula was set aside, and the far more agreeable calves foot jelly substituted for it. I have never made exclusive use of it, but have ordered it with evident advantage, as the principal diet, to patients laboring under chronic intermittent; whether from its medicinal virtues or its alleged nutritious qualities, I cannot pronounce. The spider's web has received many encomiums from high authority. It would seem, from the reports, to be a narcotic—perhaps also a tonic and stimulant. I have no experience with it.

Notwithstanding the employment, however judicious and persevering, of the most valuable and efficient of the remedies for intermittent,—selected however carefully from the long list thus cursorily treated of, to which an equal number might be added from the books and from promiscuous practice among nurses and the common people—notwithstanding all these efforts, your patient will still occasionally continue to suffer, if not as regularly as at first, yet from time to time, from the recurrence of paroxysms of his obstinate tormentor. When this degree of tenacity has been attained, nothing will remove the disease, short of an entire alteration of all his habits of life and modes

of living. Advise him to change his place of abode for a time, and abandon his accustomed avocations. Let him take a long journey, or what is still better, as affording a more impressive contrast in air and diet, etc., a sea voyage of some considerable extent and duration.

CHAPTER V.

REMITTENT FEVERS.—BILIOUS REMITTENT.

OF REMITTENTS. These have been defined to you to be fevers presenting at calculable intervals notable abatement or relief of the prominent and characteristic symptoms, yet in which there occurs no perfect or complete apyrexia. From continued fevers, properly so called, they are distinguished by the degree and regularity of these periodical remissions. The best example of this type of fever which can be instanced to you, is our ordinary autumnal endemic, generally denominated Bilious Fever, and on account of this striking trait in its history Bilious Remittent, a phrase first employed authoritatively by Rush, and now sanctioned by universal usage. Of all the diseases which are to claim your attention here, I am disposed to consider this the most important—from its annual presence in so extensive a section of our southern country; from its numerous attacks or epidemic prevalence in so many localities; from its frequent violence, rapidity and proportional mortality; and lastly, from the heavy responsibility incurred by the physician in the management of this common but formidable malady, over which he is expected to exercise, and indeed may acquire, a special control, by the judicious and energetic application of the appropriate remedies.

BILIOUS REMITTENT belongs almost exclusively to the warm months of hot climates; it is the scourge of our summer and autumn. I will not deny the possibility of the occurrence of sporadic cases even in the winter seasons of southern latitudes, but within the limits of the United States they are very rare,

and must depend upon peculiar predisposition and other unaccustomed contingencies. In our own immediate neighborhood attacks are sometimes met with as early as April and May, the number increasing with the advance of the season, until the cooler temperature of October checks its progress. It disappears when frost sets in.

The prefix which forms a part of its title, announces the fact universally observed and acknowledged, that from its invasion and throughout its progress, the condition and function of the liver are deranged and disturbed in notable manner and degree.

An attack of this disease constitutes what is generally spoken of as the "seasoning" of strangers in hot malarious districts; having undergone which they are considered as "acclimated," and thereby better fitted to endure the influences of our peculiar locality and atmosphere.

The notorious predisposition of the stranger is not well understood. It is supposed to be connected with, if not referable to, a robust, plethoric, phlogistic diathesis or habit of body. It is most marked I think in the sanguineous temperament, as seen in the Briton, the German, and the man of New-England. In proportion to the harsh roughness and danger of this "acclimation" is the importance of the rational prophylaxis.

The newly arrived emigrant or visitor should live very temperately, but not too low or abstemiously. While he shuns all modes of special excitement, moral or physical, we must not advise too sudden a change of habits long familiar to him, unless in themselves vicious and injurious, or in some way rendered particularly unsuited to his new situation. The non-naturals, as they are absurdly termed, must be attended to—free ventilation, nourishing, pure aliment, exercise short of fatigue, tranquility, and sufficient sleep; great personal cleanliness must be observed, and the bowels kept in a regular state.

I cannot denounce too strongly the measures recommended by some, of active purging at intervals, of low diet, of occasional bloodletting, of confinement within doors, and last and worst of all, of a mercurial salivation. Instead of being in any degree preventive of fever, all these rather tend to bring the system into that irritable condition so generally associated with weak and low action, and depressed tone or vital power, which

renders it more liable to be impressed by that class of causes which we style exciting and occasional. Experience indeed, the surest and most infallible test, has not only proved their absolute inefficiency for good purposes, but has shown clearly enough their evil influences.

Causes. Of these, the most universal, prominent and certain, is the miasm from low grounds, stagnant pools and swampy meadows, designated and discussed under the generic titles of malaria and marsh miasma; nay, this is probably the exclusive source of our autumnal remittent. Whether the same type of febrile disease can be brought into existence by any other agents is at least extremely doubtful; for we must not confound the subject of our present discussion with any of the other forms of fever; continued, inflammatory, ephemeral, ardent, or by whatever names they may be known. Its analogies in course and history with malarious intermittents are, as we shall hereafter see, very close; from all continued fevers it is widely separate. Nor is there any difficulty in accounting for its miasmatic origin in early spring. The decaying and half decomposed vegetable matters—leaves of trees, and leaves of flowers, and stems of shrubs and plants produced during the preceding summer, and dying and withering in the intervening winter, are ready to receive and are promptly acted upon by the influence of the vernal sun of April and of May.

There are, however, many contingencies which forcibly aid the paramount atmospheric cause of which we have been speaking, and are classed as exciting or occasional. Exposure to the heat of the sun by day, to the damp and chilling night dews, to any sudden alterations of temperature, as by getting wet and cool in a summer shower; fatigue and exhaustion whether from exertion of the body or the mind; violent emotions or gusts of passion; and excesses of all kinds should be enumerated here. It is, however, to the specific impression upon the system made by the ærial poison, of which we formerly treated so much in detail—malaria, that we must ascribe all the peculiar and characteristic conditions of type, and progress, and cause, which distinguish bilious remittent from all other fevers, and constitute it the endemic scourge of certain well known localities, in which it is not unfrequently aroused into epidemic and pestilential sway.

History of the invasion and course of bilious remittent. It is remarked by Robert Jackson in his excellent treatise of this fever, that an indescribable uneasiness of the stomach precedes uniformly all its other symptoms. This is accompanied or soon followed by a feeling of languor and weariness. There is sometimes chilliness, which may perhaps increase into rigor or shivering; but is never or rarely, so marked or violent as the ague of an intermittent. The skin soon becomes hot and dry and constricted. Headache is complained of early in a large proportion of cases, with a sense of fullness, heat, throbbing, vertigo and occasionally, confusion of ideas. The face is flushed and turgid, the eyes red and suffused; the expression of countenance anxious and impatient. There is pain in the back and limbs—the calves of the legs especially—with muscular debility and prostration; hence the recumbent posture is sought and persisted in. Respiration is hurried and uneven. There is much thirst; the sufferer is restless, tossing heavily from side to side. The circulation meanwhile increases in rapidity and force with irregular determinations to different organs; the pulse is full, hard and bounding, with a perceptible abruptness—jerk or quickness. It is frequent—beating from ninety to one hundred and twenty, or more in the minute. The tongue in a few hours becomes coated with a whitish secretion, progressively thickening into a dense crust or fur, tinged of a brownish or yellowish hue, under which its sides and edges are seen of a preternatural fiery red; it is often somewhat swollen and of a sodden look; the indentations of the lower teeth being distinctly impressed upon its margin, and shown when protruded. The gastric uneasiness above spoken of augments steadily; there is oppression, nausea, retching and vomiting. The ordinary contents of the stomach are first thrown up; the ingesta present, water, mucus, then bile of healthy character or variously vitiated, greenish or blue, dark brown, etc. There is some relief after every such vomiting, but this relief is transient, and the organ continues disturbed, oppressed, uneasy, and irritable. The bowels are generally constipated, and in the majority of instances moved with some difficulty. The stools procured by the action of purgatives vary much in the progress of the cases. They differ in hue and consistence, and in all their qualities are indeed so multiform as to bid defiance to every attempt at de-

tailed description. They may show, according to the varying condition of the secretions generally, and of that of the liver in particular, either a deficient flow of bile, the mucus, serum, etc., evacuated, being whitish, or colorless, or mixed merely with blood or sanies; or an increased discharge and morbid state of this fluid; they are thin, dark brown, greenish and even black; often exceedingly acrid and offensive.

The symptoms above described of prominent febrile excitement continue from nine to eighteen hours, after which they undergo a partial and gradual abatement. The head ache is less intense; the stomach less agitated and irritable; the thirst less distressing; the general uneasiness and restlessness diminished; the patient sleeps. It is gratifying to find a free perspiration establish itself over the whole surface during a long and quiet slumber; in remissions less marked the moisture will be but slight, and extend perhaps only over the forehead and face, soon drying away.

We must not omit to observe here, the striking analogy of bilious remittent in its course and progress, with the periods of the double tertian formerly described.

It is familiarly known even to nurses and the common people, that the exacerbations of alternate days, offer a very notable correspondence in time of invasion, mode of access, degree of violence and length of duration. They preserve throughout, in many cases, too, the particular determinations with which they are connected or complicated; thus, the head will be most affected on the first, third and fifth days, and the stomach or bowels on the second, fourth and so on.

We meet occasionally with examples of equally obvious analogy to the triple tertian. There will occur, on alternate days, in these, two definite exacerbations, with but a slight and transient remission between them. This I suppose to constitute at least one of the forms of herosthesis of the ancient writers, or accumulation of paroxysm upon paroxysm, as alluded to by Robert Jackson; on the intervening days there may be but a single exacerbation with a longer, better and less partial remission. Yet these cases are always severe and troublesome. The duration of the remission will, of course, vary much, being inversely proportioned to the violence and obstinacy of the attack.

The exacerbation encroaches again earlier or later in the forenoon, with a renewal or exasperation of the symptoms detailed, and if the disease is progressive or unchecked, with added intensity. The vomiting is more frequent and distressing, developing a painful heat and soreness of the epigastrium; pressure with the hand upon the *scrobiculus cordis* cannot be borne; the head-ache is oppressive and intolerable; the eyes will not endure the light, and the ear is pained by noises or even ordinary sounds; the restlessness and jactitation prevent sleep, or render the slumbers taken, short and unrefreshing. There is great anxiety, fretfulness, despondency; the pulse loses some of its fullness, but is still tense, frequent and abrupt. The tongue assumes a dark hue, and the thick brown fur is even blackish along the central line; it is often dry and chapped or cracked. The bowels, sometimes obstinately costive, refuse to yield to our laxative formulæ; at others, tormina and tenesmus annoy the patient with stools frequent, thin and offensive, or even acrimonious; respiration becomes hurried and embarrassed and interrupted with heavy sighs. There is great muscular debility.

From such concussions as these, the constitution must suffer inevitable derangement and lesion. After a few exacerbations, in number inversely proportioned to their violence or to the resiliency of the system, we begin to see the evidences, on the one hand, of exhaustion and prostration of the vital powers, or, on the other, of local disorganizations, foreshown usually by the observed determinations to particular viscera. The pulse sinks, is small and feeble; subsultus tendinum, hiccup, tympanitis, delirium, present themselves; the functions are all more and more impeded in their play, and death ensues after a period varying from seven to thirteen days. The vulgar calculation which rates the average duration of the most ordinary form of bilious remittent at about nine days, is not far from the truth.

It is not uncommon, however, especially among the most perfectly acclimated adult natives resident in malarious localities, and strangers long familiarized to our atmosphere, to find bilious remittent lengthening itself out to a tedious protraction; the patient sinking, after the tenth or twelfth day, into a low state of fever resembling the less severe grades of typhus, and, hence,

obtaining among us the designation of the typhoid stage of bilious fever.

Here, the well marked lines which separate the period of exacerbation and remission, are almost effaced; the characteristic periodicity almost obliterated; the fever degenerates nearly into the continued type, and the patient, in the language of the older practitioners, "wades through" the attack with no definitely regular changes observable from time to time, until by the success or failure of our efforts in his behalf, he recovers or is lost. The pulse is small and chorded, the tongue throws off its fur, and is smooth, red and dry, or smeared over like the teeth and lips, with foul sordes; the stomach loses its irritability, and the vomitings cease; the stools are dark or even black; meteorism occasionally shews itself; there is muttering delirium or disposition to heavy stupor and coma; the countenance is dull and inexpressive; muscular languor and great debility ensue, with nervous tremors on motion, and perpetual subsultus tendinum. This condition is almost indefinite in duration. I have known cases protracted in three instances to thirty, thirty-five and fifty days, though the average would scarcely reach beyond fifteen or twenty.

I have thus given you a history of the ordinary course of this familiar disease; of two of its anomalous and fortunately less frequent forms, it is also necessary to attempt the portraiture.

With the first of these, the experience of the last ten years has made the practitioner of the South and South-West unhappily too well acquainted under the denomination of Congestive fever. In certain localities, indeed, the ancient inflammatory features of malarious endemics seem to have disappeared, and to have become supplanted by the more hideous and pestilential modification thus entitled.

I have elsewhere taken occasion to protest against the employment of the term congestive as denoting a separate and distinct type of fever. Its correct use is merely as a qualifying adjective, significant of certain contingencies which modify the course and symptoms—perhaps of all, certainly of most types of fever.

Thus Armstrong speaks of congestive typhus, and we are fa-

miliar with histories of congestive intermittent—tertian especially. In this section of country, the title “congestive fever” has been made to include under one head, (as though the same disease was treated of,) our winter typhus and typhoid fevers, and our typhoid pneumonia, as well as intermittents and autumnal remittents.

I have attempted, in a former lecture, to show what congestion is, as contra-distinguished from inflammation and irritation. Cases of fever occur, as every physician must have remarked, prominently complicated with each of these three conditions. We may not have acquired very definite notions of the nature of each of them absolutely; but relatively, we are, I think, in little danger of confounding them.

We have already presented you with the familiar picture of ordinary inflammatory bilious remittent; contrast it, for a moment, with a congestive case, so frequently met with in numerous localities, and in some of them annually assuming an endemic prevalence. In the former, the face is flushed and turgid, the pulse full and hard, the organs painfully excited, highly irritated or menaced with impending inflammation. Here, on the contrary, the pulse is contracted—often, but not always, feeble from the first; the breathing embarrassed and oppressed; the surface sometimes cold, sometimes hotter than natural, sometimes bedewed with an abundant sweat. The head is confused or vertiginous; the face pale or livid; the patient often makes no complaint, and if asked as to his feelings, says he is well, and expresses a vague sort of surprise at the enquiry. The tongue is little changed; there may be occasional retching with vomiting, but this is seldom urgent. Pressure made firmly on the abdomen occasions uneasiness, and there may be diarrhoea. The remissions of such attacks are not apt to be well marked; but there is exhibited, from the beginning, a tendency to the continued form and the typhoid condition. After a few days, the patient seems more or less comatose, with small and frequent pulse; there is indisposition to move, with great muscular debility and inattention to surrounding objects; the tongue and mouth are dry, and the teeth covered with sordes; there is meteorism, the abdominal distention being sometimes immense and highly resonant; tenesmus with tormina come on, and if the

bowels were not loose before, they now discharge frequent acrid and offensive stools, of various consistence and composition, greenish, sanious, and even black; hiccup and subsultus tendinum precede death, which may take place from the fifth to the twelfth days, though some attacks of this sort run on into an indefinite protraction.

You will meet also occasionally, though it is to be hoped rarely, with a truly malignant form of our autumnal fever, not less to be dreaded than the most terrible shape of any other pestilence. In this, the system seems to sink at once prostrate before the invasion or exacerbation, which can scarcely at times be called febrile. Reaction, to use our technical phrase, does not take place, or very feebly if at all. The skin is cold and covered with a clammy sweat, as in the collapse of cholera; the pulse is weak and fluttering; the stomach is very irritable, with frequent and painful, but usually ineffectual efforts to vomit; the countenance is shrunken and pale or livid; there is often low muttering delirium; with shivering and fainting. In some cases, no complaint is made, a lethargic insensibility seeming to oppress the patient; in others the most extreme anguish is endured by the miserable sufferer, who in his agony often utters groans or loud cries. The vital powers are speedily and irrecoverably exhausted by the recurrence of a few such exacerbations, although the remissions in this class of examples are apt to be well defined, and full of a transient relief and consolation. The third, fourth or fifth return of the train of symptoms delineated, for the most part, puts an end to the distressing scene.

In a striking case of this kind, which came under my care in 1823, caused by peculiarly imprudent exposure in our low country, there attended every exacerbation, an intensely painful determination to the bowels. The pulse became full and undulatory; the most excruciating tormina and tenesmus were perpetually urgent, with scanty and dysenteric evacuations. The mind was confused; the skin moist and relaxed; with frequent disposition to syncope. The remission offered great relief from all these peculiar symptoms, differing little indeed from that of an ordinary attack of fever, except that there was evident an undue degree of debility. The patient died on the third day.

The general Prognosis in bilious remittent differs somewhat

in different localities, and in successive years in the same locality. From the authentic records of its mortality, it is certain that the proportional success of the modes of treatment in the south and south-west, must be greater; or that the violence and fatal tendency shown by the disease must be less, than in other malarious regions.

From all that I can learn on the subject, I am not disposed to rate the proportion of deaths within our city at more than one in thirty; it may exceed that amount, yet not greatly, in the country practice throughout the southern states.

It is not among us, then, that converts are to be made to the obsolete temporizing measures of the ancients; the medicine expectante; the homiopathy of the German dreamer; nor to the iced water, leeches, mucilage and lemonade system of the modern Frenchman.*

I must be understood, however, in the above statement, to speak of the ordinary form of inflammatory remittent. The congestive variety which has sprung up of late years, into such a gloomy notoriety, is unquestionably far more dangerous and fatal; but we see little of it in this immediate district, and I am not prepared to pronounce upon its ratio of mortality.

The individual prognosis will depend, of course, upon a great variety of circumstances. The form which the attack may assume; the condition of constitution in which the patient may be assailed, whether permanent or transient; the mode and degree of exposure to the cause, and the immediate history of the invasion, and of the contingencies which precede or accompany it; all these considerations will have their influence.

A recently arrived stranger, an intemperate man, one of active habits, of fatiguing exercise or hard labor, having lately visited and slept in our malarious low country, or having committed an unaccustomed debauch, will, it is evident, be in peculiar danger from the very first, and will undergo a very inhospitable accli-

* In 1827, I attended and made a record on my case book of 274 cases of fever
In 1835, " " " " 222 " "

Of these in 1827, there were of bilious remittent,	-	-	188
" in 1835, " " "	-	-	123

In each year there were three deaths, six in all.

311

Making one death in about fifty cases taken promiscuously.

mation. Contrast the risks of such a case with those of a female patient of sedentary habits and delicate frame, protected as far as possible from exposure, and unacquainted with any form of excess.

In the progress of an attack, the favorable symptoms are,—the comparative shortness of the exacerbation ; the definite relief and long duration of the remission ; the postponement of the exacerbation beyond its expected period ; the comparatively moderate return of the disorders of different parts which attend upon the exacerbations ; the diffusion and abundance of the sweat which flows during the remission ; the readiness with which the bowels are acted on and controlled ; the subsidence or diminution of special determination to vital organs ; the tongue becoming cleaner and less red ; the pulse slower and softer. The tendency to convalescence, is often strongly marked by the enhancement of the remission into an apyrexia, and the conversion of the case into the intermittent type.

On the other hand, an imperfect, ill defined remission ; the quick or anticipating arrival of the exacerbation ; the special frequency of the pulse, a symptom always menacing ; embarrassment of respiration ; painful and violent determination to any important organ ; dark color or blackness of the stools ; great muscular and general debility, as shown by disposition to fainting, flagging pulse, subsultus tendinum, relaxation of sphincters, and involuntary discharge of fœces and urine ; a low muttering delirium ; picking at the bed-clothes, and catching at imaginary objects in the air ; a bronzed hue of the surface, produced probably by a sort of capillary paralysis, rendering the smaller circulation slow and stagnant ; tympanitis, and hiccup ; these are all signs of increasing danger and difficulty. The hippocratic countenance, and the exhalation of a cadaverous odour, are often the immediate precursors of dissolution.

The Convalescence from bilious remittent is attended, especially in our autumnal months, with a rather tenacious proclivity to relapse or recurrence of the disease ; in this as in so many other circumstances exhibiting its analogy with its connate intermittents. This is more to be apprehended when the digestive organs of the patient remain weak or oppressed, with a tongue furred or red, and a bitter taste in the mouth. These relapses are more apt to occur at the septenary periods—the seventh or

fourteenth day, than at any others, and lay the foundation occasionally, among various ill consequences, of the most tenacious, indomitable and protracted intermittents.

The Diagnosis of the disease which we are discussing, has never appeared to me to be attended with any difficulty either theoretical or practical. The characteristic traits of yellow fever, with which some writers have confounded it, on the one hand, and those of typhus on the other, which it may be said to approach in its congestive shades, seem sufficiently well marked to prevent all misapprehension. Of the first I shall say nothing here, as they are to engage our particular attention in the proper place. Of the latter I will observe that the locality and season are the circumstances which serve to distinguish such cases as present themselves from time to time, offering a strong similarity in symptoms and history. This similarity doubtless has laid the foundation for the common belief of the existence of a separate variety of fever known familiarly as congestive.

And indeed it must be acknowledged that there are instances in which congestion, an intense congestion, (of which capillary paralysis is a large part,) being the prominent feature, bilious remittent, yellow fever, typhus and typhoid fevers, catarrhal affections, nay, even malignant cholera itself, would hardly be discernable each from any other. But it is not consistent with an enlightened pathology to fix the attention exclusively upon any of these anomalies, and from them to draw the history of types in disease. The ordinary current of events, the regularity and degree of relief at certain calculable intervals, and the equally certain and calculable return of the exacerbations, constitute a history so readily recognizable as to admit of little chance of mistake in any observer of average intelligence.

The effects of the attacks of bilious remittent are fairly divisible into those which are discernable during the progress of the disease, and in convalescence, and such as are prominently displayed in post mortem examinations. Of the first of these I have already spoken; the second are equally interesting and impressive, perhaps, and nearly as characteristic as we shall find the third.

After a severe attack the hair sometimes falls off leaving the scalp bald; the muscular strength is often impaired for an inde-

finite period; the memory is occasionally obscured and the mental faculties generally dimmed or enfeebled. Where there is predisposition to pulmonary affections, the lungs are apt to suffer seriously, probably from both congestion and inflammation, and a troublesome cough long harrasses the invalid. The tone of the stomach is not unfrequently lost, and an annoying train of, so styled, dyspeptic affections commences, among which costiveness and alvine irregularities are usually the most troublesome. Upon the liver and spleen, however, falls doubtless, the principal and most direct pressure of the suite of morbid actions in which this type of fever essentially consists. The liver is the seat rather of congestion, I am disposed to think, than of acute inflammation. Jaundice is hence one of the most frequent consequences of bilious remittent; I have repeatedly seen it assail the patient before he had recovered sufficiently to leave his bed. This connection was noticed generally in the summer and autumn of 1824; very few patients recovering from fever in that year without becoming icteric. Nor is it rare to meet with hepatic enlargement and induration, attended by a long succession of sufferings from visceral obstructions and mechanical impediments to the performance of the abdominal functions, and to the transmission of the abdominal circulation. Hence ascites and anasarca, and hence diarrhœa and dysenteries called hepatic, and occasionally melœna and true intestinal hemorrhages. The spleen suffers from remittents of malarious origin as from their kindred intermittents, though not by any means so uniformly, sometimes undergoing a permanent and inconvenient increase of size or hypertrophy.

The Necrotomy of bilious remittents has been less definitely portrayed than one would expect in reference to a disease so frequent and well known. We may account for this in part, by stating that death in a great majority of cases does not occur from any special lesion or disorganization. The traces left by the fatal malady are diffused, and assume a prominence in various parts of the body relative to the constitutional predispositions of the subject, or the epidemical modification prevailing, rather than characteristically defined or uniform.

There is usually considerable engorgement of the brain and its membranes. The lungs do not often show any striking

changes. The mucous membrane of the stomach and intestines is highly injected in severe and short attacks. In more protracted cases follicular ulceration may be found throughout the whole extent of the bowels. The same tissue is sometimes found thickened and softened as well as reddened. There is also an evident engorgement of the vessels of both liver and spleen, which organs are usually enlarged and heavier than natural. They are sometimes indurated, but at others softened and brittle. Dr. Stewardson, of Philadelphia, describes a striking and peculiar change of color in the liver, which he regards as indicative of "the essential anatomical characteristic" of this disease. "The natural reddish brown tint is entirely extinct or only faintly to be traced, and the viscus assumes a hue of mixed "grey and olive." Its substance, he says, is generally somewhat softened.

Of the Treatment of bilious remittent or autumnal malaria fever. In the management of fever generally; and certainly in the instance at present under consideration, the attention of the physician should be from the first directed to the local determinations, so promptly developed and so urgently harrassing in a majority of cases, and in a large proportion so full of real dangers. There is vehement impulse of blood toward the brain and its membranes, whether irritative, congestive, or inflammatory, as shown by flushed and turgid visage, red eyes, head ache, delirium, etc.—upon the medulla spinalis, with violent pains in the neck and down the back, and sympathetic aching of the muscles of the limbs; to the stomach and other abdominal viscera, as denoted by gastric oppression, vomiting, fullness, tenderness, heat and the like. To relieve these local determinations almost universally accompanied with unequivocal tokens of great excitement, of an increased and morbid action in the whole circulatory system, constitutes doubtless, our earliest and most prominent indication. How are we to reduce morbid excitement, diminish irritation, resolve congestion, prevent inflammation with its train of destructive consequences? How are these ends to be best accomplished, what means are those which shall combine the most immediate efficiency with the greatest ultimate safety and the most entire well being of our patient?

In the great mass of writings which are to fall into your hands,

and in the majority of schools of medicine in Great Britain and our own country, you are taught that the first and principal remedy in this the invading stage of fever, is venæsection; and you are directed to an energetic as well as prompt employment of the lancet in order to ensure its beneficial effect. The rule is laid down forcibly by Rush and Clutterbuck, and strenuously echoed by McIntosh and Smith, yet I must venture to warn you that it is by no means applicable to the extent or with the universality implied in their instructions. A rational experience founded upon the observation of an immense mass of facts has taught considerate practitioners the necessity of caution in the abstraction of blood, as a remedy for the diseases of the hot months of southern climates. This caution seems reasonable enough when we reflect upon the inevitable influences of the protracted heats of summer and autumn on the human constitution. In all who have been subjected to these influences we can distinguish a certain degree of atony and laxity of the general fibre, resulting doubtless from the langour always produced by protracted high temperature, with its wasting perspiration and impaired appetite and digestion, reluctant exercise, prompt fatigue, restless nights and short and broken slumbers. The constitution under these circumstances has lost some of its elasticity, its power of action and of resistance, while its general excitability and the activity of some of the functions are positively enhanced. Hence any cause of excitement when applied, produces at once an undue impression, which runs rapidly into exhaustion and prostration, as a weak man is intoxicated and rendered helpless by a moderate draught of wine.

In the selection of our remedies then for the maladies which affect the system when thus disordered, our preference ought to be carefully accorded to such as will most effectually subdue the force of morbid action, with least injury to the *vis vitæ*, the natural and permanent powers of the several organs of the body.

In regard to malaria fever—could we reasonably hope to prostrate the disease at a single blow, as is often done in the cure of the phlegmasiæ, in pleurisy, etc., in which an occasional cause of transient influence has ceased to act—we might more implicitly trust to the lancet; but the case is far otherwise. Here the atmospheric and climatic predispositions are permanent, and the

poisonous cause is still diffused around the patient, impressing the tissues with a continuous and unavoidable agency. Success does not depend upon, nor can we hope or expect to attain it by any single measure, however judicious and energetic. We must, I repeat, change as entirely and as promptly as we may, the state or mode of action—but with as little subtraction as possible from the tone or power of the agents. Upon these principles venæsection never can or will be a favorite or general remedy with us in the treatment of bilious remittent fever. No scientific pathologist will venture to deny, that there is something in the very nature of the case, which modifies both the original irritation here, and the inflammation which may be developed subsequent to and probably dependent upon it. In local affections, coincident with fever, of whatever form or type, you have some mode or condition uniformly connected, which determines them to differ specifically from all local affections of the same organs, unassociated with fever of that special form or type. This was stigmatized by the master of the short-lived French school, as “ontology and essentialism;” it is truth, nevertheless, and reason. In phrenitis, properly so called, there is inflammation of the brain and its membranes. In fever there is often, Clutterbuck says always, inflammation of the brain and its membranes.

In gastritis, the mucous membrane of the stomach is inflamed; in many fevers, Broussais says in all, there is inflammation of the stomach. But no one confounds phrenitis or gastritis with idiopathic fever, or doubts the necessity of a plan of treatment adapted to them separately.

“The inflammation that is present in fever,” says Southwood Smith, “is peculiar and specific, differing essentially from ordinary or simple ‘inflammation,’ and the difference between them requires a very considerable modification in the appropriate treatment.” He supposes the peculiarity of febrile, as contradistinguished from simple or ordinary inflammation, “to consist in less activity in the vascular, and greater depression in the nervous system.”

Among our Southern practitioners some are to be found who make no use of the lancet in the fevers of summer and autumn, and who assert the success of their treatment not to have been diminished by their thus abstaining altogether from it. All ex-

tremes, however, necessarily imply error, and this is an obvious extreme.

For myself, it is proper to avow, that in the practice of a quarter of a century, I have bled as few patients in bilious remittent as any physician who uses the lancet at all. I cannot presume to affirm, that I have always selected the cases proper for its employment, or that I have omitted none in which it was indicated; but the instances are very few in which I have been satisfied of my having derived any decided advantage from it; nor have I been disposed, in reviewing my course, to regret its omission in any.

It will be difficult, if not impossible, to lay down, with precision, the exact contingencies in which you will be called on to bleed or not to bleed; the general principles which are to guide you, being rehearsed, the rest must be left to your own tact and judgment.

The indications for the use of the lancet are much more likely to present themselves in a recent emigrant or visitor from some colder and more bracing climate than our own. Such a stranger brings with him hither the obvious marks of what is familiarly and not inaptly styled "the phlogistic diathesis." His ruddy visage, full muscular habit and bright complexion, well known tokens of the sanguineous temperament, show readier tendencies to ordinary inflammatory excitement, and his case will demand a treatment diligently adapted to his particular state of constitution. If called to him early in the attack, you will find him with a throbbing temple; a pulse hard, full, abrupt; a red eye; a turgid visage; an anxious expression of countenance; violent pain in the head and along the spine; a hot, dry skin, and an irritated stomach.

You will not hesitate to open a vein and take away from him at once a sufficient amount of blood to subdue the violence of vascular action; nor will you measure the number of ounces or stop the flow until you have obtained your object. It is at this point of time, and by this mode of resorting to venæsection that you are to derive advantage from it. The cases are rare in which it will be found beneficial to repeat it, and still rarer those in which the delay of even a few hours does not render it at least comparatively inappropriate and ineffectual, or improper.

Again, if your patient, whether a stranger or a native, should exhibit at the invasion of the disease, an inordinate or peculiarly vehement determination to the head or stomach; if he be mad or furiously delirious or comatose, with a full pulse and hot skin; or if he complain at this early stage of excessive tenderness at the epigastrium, with inability to bear pressure, and pain and heat increased on vomiting, you must bleed him—and bleed him until you procure relief from these urgent symptoms, or until the pulse by its yielding give you warning to stop. Perhaps, indeed, it will be best to abstract blood in all cases in which very special intensity of pain or other definite proof of dangerous determination to any vital organ constitute a prominent symptom at the early stage or very commencement of the febrile paroxysm, unless at the same time it be expressly contra-indicated by the state of the pulse or other contingency. So far as my own experience warrants, these are the only circumstances which justify the use of the lancet in our endemical remittents. I say justify, for I hold that venæsection should never be regarded as a matter of choice, but of necessity. In ordinary cases occurring among our native citizens and old residents, where the force of the attack is not specially aimed at any single important organ, but diffused over the system generally—"the mixed cases" of English writers, bloodletting is not only unadapted, but improper and injurious—its immediate effect is sometimes irremediable prostration. A protracted illness, a slow and tedious convalescence, a permanent proclivity to visceral obstructions and hydropic effusions, are some of the ill consequences which follow its injudicious employment.

The topical abstraction of blood in fever, eulogized on the one hand, in most exaggerated terms for its remedial efficacy, has on the other been sometimes spoken of with undeserved contempt. As a means of relief from local determinations in the first stages of common inflammatory attacks, there can be no reasonable objection to it. Leeches are preferred by the majority, but cupping answers I think, a better purpose. Both the cups and leeches should be placed as nearly over the organ assailed as may be convenient; to the temples or the back of the neck, or on the course of the spine to relieve the brain or vertebral cord; to the epigastrium or lower abdominal surface if the vis-

cera of this cavity be affected, and to the side or chest for pulmonary derangement. I have already taken occasion to say that I do not coincide in opinion with those who attribute the beneficial effects of these operations, directly to the depletion of the small or capillary vessels from which the blood is taken away. I ascribe the advantage we gain from them principally at least, and in the majority of instances, to the revulsion they produce. It is common, for example, to speak of the leeching of the epigastrium as an immediate means of detracting blood from the vessels of an inflamed stomach, but you are well aware that there is no vascular connection with the surface except through the general circulation.

If there be any fatigue or inconvenience occasioned by the application of the cups or leeches, or any objection to the necessary exposure, it is my habit to substitute for them a warm mustard cataplasm or other fomentation, with which, unless I have grossly deceived myself, I have obtained results little less impressive and satisfactory. Nor can any thing be more evident than the preference due to the latter modes of derivation in the advanced stages and in cases of threatening debility—when the loss of only a few ounces of blood may sink the patient irretrievably.

The cold bath, one of the most ancient and universal remedies for fever, demands our early attention as specially indicated in the variety of it under discussion. The temperature of the season, the very nature of the attack, the symptoms present, the condition of the patient, are all such as to prepare us to expect from its employment the happiest results. Accordingly, I am disposed to rank it among the most efficient of our febrifuge measures here—far above the lancet both in the extent of its adaptation and in its degree of specific utility. All that we can hope or anticipate from bloodletting may be obtained in a majority of cases by the use of the bath, while the latter possesses this striking and obvious advantage, that we can repeat it as often as the symptoms are renewed that require it. Nor can I help expressing my surprise at the very limited resort of my professional brethren to it, when I consider how instinctively we desire it as a relief from the burning heat that oppresses us, and how certain and immediate a means it is of affording this relief.

Of the three modes of employing it, affusion, namely, immersion and ablution, the first is the most impressive and efficacious, the last the least liable to objection or risk in doubtful cases. The particular indications which demand the resort to it unhesitatingly, are found in the youth and general vigor of the patient and the heat and dryness of the surface. The local determination which it controls most promptly is that to the brain, shown by head ache, flushed face, red eye, delirium, etc. with a full, hard, bounding pulse. Seat your patient in a convenient receptacle and pour over his head and naked body from some elevation a large stream of cold water; continue this until he is pale or his pulse loses its fullness, or his skin becomes corrugated and he shivers. On being dried and replaced in bed, a genial sense of comfort and refreshment will attest the benefits derived from the process, which, as I said above, may be repeated whenever the symptoms are renewed which it is so well adapted to remove.

If the shock of this shower bath or cataract be too great, immersion, which many prefer, may be substituted. Few shrink from this, and almost every one will evince the high gratification and enjoyment derived from it. One of the pleasantest effects following the bath, is the complete relaxation of the surface which it so often brings on, attended with a copious and salutary sweat. I need not warn you against the nearly obsolete practice of endeavoring to accelerate or increase this by wrapping in blankets or shutting up the apartment, or warming it artificially. The patient is to be covered agreeably to his sense of comfort; and though I would not place him in a current or draught of air, I would have his chamber fully and freely ventilated.*

Some have strangely enough imagined it to be necessary that evacuations of some kind should be premised to the application of the cold bath, but this is a worse than superfluous caution.

* Amerigo Vespucci in speaking of the treatment of fevers among the Indians of this then newly discovered hemisphere, mentions the cold bath as almost their only remedy, and thus describes their mode of employing it: "*Cum eorum quempiam febricitare contigit, horâ quâ febris eum asperius inquietat, ipsum in frigidissimam aquam immergunt et balneunt; postmodumque per duas horas circa ignem validum donec plurimum caleseat currere et recurrere cogunt, et postremo ad dormiendum deferunt; quo quidem medicamento complures eorum sanitate restitui vidimus.*"

It does positive harm by postponing the remedy until the time of its most special adaptation and greatest utility is past—the earliest and forming stage of the febrile attack. It is here I repeat, that you will find it most admirably beneficial. Yet you will meet with frequent occasion to advise its repetition at intervals throughout the whole progress of the disease; and even when the patient can no longer bear either affusion or immersion he will often be relieved and gratified, by washing and sponging him, especially over the hands, arms, breast, feet and legs. In the very latest stages of our worst fevers, ablution in this way with ardent spirits is found singularly refreshing.

The affusion of cold water locally upon the head in a stream of some height, the spout bath, is of inestimable advantage in cases where the cerebral determination is inordinately violent, dangerous or tenacious; and will bear to be repeated far oftener than it would be proper to take the patient out of bed for the administration of the general bath. Support him in a leaning posture over the bed-side and dash the current from a pitcher over the vertex for some minutes and from some elevation above him. Many who dislike all the other modes of using cold water, entreat for this operation as the most soothing of possible indulgences; nor have I yet met with any ill consequences from allowing its most unlimited frequency of repetition.

The cold bath in its several modes of general application is prohibited, let me remind you, when the patient is of feeble habit of body; much advanced in age; much exhausted or enfeebled at the time; when the pulse is weak or the skin cool or covered with moisture; when the lungs are oppressed or inflamed; and when diarrhœa is present. Its repetition is forbidden when it has occasioned a protracted chill or rigor, or the patient has continued to feel cold or uncomfortable from it.

It has been with many physicians a practice so common, as to have grown indeed into a general rule, to commence the treatment of bilious fever with an emetic; in the domestic management of numerous families, and on many plantations in the south, it is an uniform custom. The stomach, as was formerly stated, is assailed early; feels oppressed and irritated, and vomiting comes on spontaneously, or is eagerly desired by the patient. A degree of transient relief is thus obtained, the organ having been loaded

perhaps, by the presence of a recent undigested meal, or it may be, a collection of foul crudities and morbid secretions. The emetic is clearly indicated under these contingencies, when they can be ascertained ; as when immediately upon the invasion of fever, there ensues retching with imperfectly successful efforts, only bringing up mouthfuls of offensive ingesta or porraceous acid and bilious matters. The tartarized antimony is usually preferred, as quick and efficient ; its operation on the system is more diffused and extended, and productive of more general relaxation and more determination to the surface, than that of any other emetic. Like all other preparations of antimony, it is supposed too to possess certain specific febrifuge properties. It should, however, be administered with some caution. It acts occasionally with great violence, and produces protracted irritation. Idiosyncrasies present themselves, in which it excites cramps and dangerous spasm, on the one hand, or serious prostration. on the other. *Ipecacuanha* is a very safe and useful substitute ; or if any objection present itself to these, the sulph: zinci may be prescribed. For my own part, I do not exhibit any emetic in fever, as a matter of choice. In the circumstances above delineated, it may be the least of two evils ; but it has appeared to me to have a tendency rather to increase than diminish the gastric disorder, which belongs to the history of the disease. When it can be dispensed with, then, I prefer to abstain from it. I am especially anxious to avoid it when the uneasiness at stomach is attended with a sense of heat and weight, and when pressure upon the epigastrium is complained of. These are tokens that the irritation is disposed to assume an inflammatory character, likely to be aggravated by the impression of the emetic on the mucous surface, as well as by the vehement muscular action in vomiting.

Cathartics are universally employed in bilious remittent ; I say universally, for it is idle to speak of the transient discussions excited by the few followers of Broussais among us, or of the dreaming absurdities of the homœopathist on this topic. Their efficacy is two-fold. From the very extensive mucous intestinal membrane, we procure a large effusion of fluids ; thus depleting promptly, impressively and efficiently. To this excitable tissue we determine with greater or less vehemence, according to the

article selected; and in this way obtain a decided and very beneficial revulsion from organs more liable to be injured by febrile congestions and concussions. Among the numerous drugs and formulæ to be found in the *materia medica*, of which almost every physician has his favorite, it is my habit to select the mildest, which is at the same time sufficiently active to effect the purposes above indicated. I abstain from such as are offensive to the stomach, or occasion griping, or give rise to notable uneasiness, burning, etc., in the abdomen.

Calomel is the most valuable of our purgatives. It remains well on the unquiet stomach, is not apt to be rejected, and operates as effectually and easily as any other, in the majority of cases; yet it is rather slow, and may require to be somewhat hastened in its action. This is readily done by the administration of alternate doses of the epsom salt, (sulph: magnes:) one of the most useful of all cathartics, very widely adapted and especially safe; or we may employ in the same way a combination of the resinous with the saline purgative, mingling a proper amount of pulv: rhæi with the solution of sulph: magnesiæ; to which, if a drop, or two of some aromatic oil be added, we have a neat, serviceable and generally not unacceptable formula.

Castor oil, an inestimable domestic medicine, though not often available among adults, who dislike and reject it, will be very frequently found our best choice in our young patients. Whatever cathartic be administered, we should take care that the dose given is not so large as to oppress a delicate stomach, nor so often repeated as to offend in that respect; the interval of an hour and a half or two hours, is usually proper to be allowed. If one formula be rejected, we should change it for another and another, and we shall rarely fail by judicious combinations and modifications, to find some means of attaining our purposes, with at least comparative ease and comfort. We may farther promote the effect of the purgatives taken by the mouth, with the exhibition of laxative enemata; a measure which the false delicacy of our country has caused to be too much neglected.

Diaphoretics were formerly much more relied on than they are now, in the treatment of fever; yet although they do not deserve to be trusted to exclusively in almost any case, it is impossible to doubt their general utility and importance. They are

as you well know, divided into two classes—the sedative and stimulating; and I need hardly remark, that their adaptation varies, relatively to the stage of the attack or the modification presented. In the early periods of the ordinary form of bilious remittent, the former alone are applicable, and it is among us a very common habit to combine them with our first cathartics; a practice which, although liable to some plausible objections, is yet found to answer frequently extremely well.

The antimonials hold here the highest rank. The three most familiar preparations are the pulv: antimonialis, James' powder and the tart: antimony. The first is supposed by many to be identical with the celebrated patent febrifuge invented by James and still prepared by his successors from a secret recipe. They are all highly valuable and well deserving our confidence. I make it a rule, however, to exhibit them in quantities too small to nauseate, and to desist from their employment whenever they are offensive or distressing to the patient. Some of the salts of potass are in great repute as sudorific; the nitrate, the acetate and the citrate may all be thus employed.

Cold drinks are not only in themselves diaphoretic in fever, but seem absolutely essential to the efficacy of all other remedies of that class. We can scarcely credit, in modern times, the cruel pertinacity with which the natural and necessary refreshment of cool beverages was denied, by the prejudices of past generations, to sufferers in fever. We now regard them as salutary, and allow ice itself and iced liquids freely. I know of no limit, but the capacity of the stomach to bear them without irritation and uneasiness.

During the Remission which the management above detailed as requisite throughout the course and progress of the exacerbation is intended to hasten, to render more perfect, and to prolong, you must not allow your attention to your patient to slacken. Nay, you are now called upon, perhaps, for a still nicer and more assiduous exertion of diligence and skill, as the improved circumstances often afford a better opportunity of useful interference. Purgatives, if formerly rejected, will now probably remain on the stomach and act kindly. Diaphoretics, too, are less apt to nauseate, and may be exhibited in fuller doses, and procure a more free and diffused sweating. It is thus that you

may hope to diminish the violence of the returning exacerbation, if you cannot altogether prevent it. To subtract as much as possible from its intensity, time the administration of your prescriptions so as to bring your patient most completely under their effect, freely operated on by your purgative, fully sweated by your sudorific, just at the period of its expected invasion. Let his windows then be darkened, his apartment kept fresh and cool by ventilation, and, if necessary, by evaporation, sprinkling his floor with water, vinegar, or ardent spirits, and prevent any excitement by noise or by conversation with him.

It is always advisable farther, to meet a coming exacerbation with revulsives so applied as to counteract or diminish the local determinations to important organs. The head may be wrapped in towels wet with iced water, while the feet are plunged in the hot foot bath. Cataplasms or mustard poultices may be laid to the epigastrium or abdomen, until they redden the vessels of the skin and relieve the internal tissues. As the case progresses, your treatment must be modified to suit the varying contingencies of the successive exacerbations. Sponging the arms and breast must be substituted for affusion and immersion. Cathartics must be abandoned, and the bowels kept open either by enemata or occasional and distant laxatives. Diaphoretics of more cordial and stimulating character may be exhibited. The infusion of serpentaria is much used; the acet: ammon: (spts. mindereri,) with nitrous æther: I employ very often and with peculiar confidence a solution of the carb: potassa, with small doses of the tinct: op: camph. This combination exhibits a remarkable tranquilizing effect; quieting the disturbed stomach, and relaxing the constricted surface. It is at this juncture that benefit attends the use of the steam or vapor bath, which you may apply by Jennings' apparatus, or by pouring water or vinegar on a hot brick under the bed clothes raised upon the arch of two or three hoops; these means all tend to give a centrifugal determination to the fluids, and create an abundant effusion from the cutaneous vessels.

The drinks of the patient may be made, as is supposed, mildly nutritious, by the addition of thin mucilaginous or farinaceous infusions, such as strained gruel of Indian corn, arrow root, etc.

Epispastics may now be had recourse to. There has been

much and angry dispute concerning the use and abuse of vesicatories in fever ; but it seems to me to resolve itself fairly into a mere question of time and circumstance. While the sensorial energies are active, and the vascular excitement high, the pain and inflammation of a blister will probably add more to the general irritation of the disorder than will be compensated for by its revulsive impression. But when the case is protracted beyond a certain point, the former effects do not follow, or are of less relative importance—nay, the exciting as well as the revulsive influence of the epipastic becomes desirable. By the selection of proper periods, we may make this class of remedies, however, entirely safe, and far more valuable than if this be unattended to. If you use them chiefly as revulsives, apply them in the remission and in the vicinity of the organs you desire to relieve ; to the epigastrium or side for the benefit of the stomach or liver ; to the back of the neck or between the shoulders if the head be threatened ; along the spine or on the sacrum to relieve congestion or irritation of the vertebral cord. If, on the other hand, their stimulant or excitant effect be wished for, this is most needed as the febrile paroxysm subsides, and you should put them on during its continuance ; or it may be requisite to keep up their irritative action, which is done by applying one every fourth or sixth hour to the limbs, the ankle, instep, leg, thigh, arm, forearm, and wrist. Under judicious management, I may venture to promise you much benefit from vesicatories. They relieve determinations to important organs ; by thus subduing internal pain, they occasionally procure rest and sleep ; they rouse the dormant powers of the system, excite into renewed vigor the circulation, and improve the pulse, and spur on the fatigued and wavering functions. Even their most painful consequence, which therefore I have not attempted to evade, I mean strangury, is often found useful as revulsive, counter-irritant, and stimulating.

In the advanced stages of fever, it may become necessary to support the declining strength of the patient by an energetic and persevering administration of diffusible stimulants. This practice has been the topic of severe censure from some writers on medicine, who seem to have been guided in their notions more by speculation than experience. Death from fever may take

place in one of two modes ; there may either be lesion of some important viscus which shall incapacitate it for the performance of its functions absolutely and permanently, or 'there may be, from the violence or protraction of morbid excitement, such a degree of exhaustion and consequent debility, that the patient may sink and die, no such lesion having taken place. In the first instance, it is evident, that stimulants can be of no ultimate avail, although we may protract life for a short period by their exhibition ; nay, in such cases they may be positively injurious, increasing pain and hastening on the final catastrophe. But, in the second example, of transient depression merely of the vital powers, such as we often meet with in bilious remittent, it is not only defensible, but proper and necessary, to rouse, by these means, the depressed energies of the sick man, and fan again into a flame the sinking spark of vitality. I acknowledge the occasional nicety of the measure ; the difficulty, often extremely embarrassing, of finding such stimulants as shall avail to excite the general system—the circulatory, muscular and sensorial functions, without increasing such local irritations and determinations, congestive and inflammatory, as may have affected the organs and tissues. Nothing, however, can be plainer than the demand for immediate support to the failing powers of life ; subsequent ill consequences must be met as we may. Great anxiety is felt under these circumstances by many physicians as to the proper selection of stimulants, and much ingenuity and observation have been expended in the hope of avoiding here the Scylla and Charybdis which on either hand threaten to wreck our hopes. The spiritus terebinth: is preferred by some, under the belief that there is something specific in its mode of operation, which makes it safe even in cases of obvious inflammation, as we know it to be useful in metritis and peritonitis. Capsicum, too, is thought to possess an analogous peculiarity of action, shown in its adaptation in sore-throats, scarlatina, etc.

But I avow, for my own part, that when I see the respiration hurried and impeded by debility, the pulse flagging, the skin covered with a cold and clammy exudation, I do not entertain any very fastidious scruples as to the ulterior effects of my stimulants. I am only afraid of finding them inefficient to act upon the little remains of excitability present. I resort freely,

though by no means carelessly, to wine whey, wine undiluted or warmed and spiced, brandy with water or milk, ammonia, æther, capsicum or turpentine. Wine is usually the most manageable, as well as most permanent in its effect ; but if it disappoint us or prove in any mode objectionable, the others may, in turn, be tried, while the surface is irritated by heat, friction, mustard, and epispastics. I do not entertain a doubt, that to the assiduous and persevering employment of these measures carried out with unhesitating promptness and decision, I owe the ultimate recovery of a long catalogue of cases otherwise absolutely hopeless. The objections which have been so obstinately urged against them, originated surely in the logical essays of the closet, not in sick rooms or in hospitals ; not at the bedsides of the debilitated and the dying.

The obvious analogy of the remittent with the malarious intermittent, and of the remission of the former with the apyretic stage of the latter, long since suggested the employment of cinchona in protracted instances of autumnal fever of the present type. The practice is becoming more and more common to resort to some one of the preparations of this powerful febrifuge in the better and more marked remissions. Nay, some practitioners regarding quinine with Bell as a sedative, do not wait long for an opportunity of this sort, but administer it generally after premising such depletory measures as may be demanded. As yet I cannot but look upon both the theory and practice as uncertain, yet the experiment deserves to be cautiously made. If the sulphate of quinine in ordinary doses be offensive to the stomach, however, or determine to the head as it will sometimes do, with pain, dizziness, tinnitus aurium, I would desist and fall back upon the less impressive but safer course already pointed out.

The great impediment presented to the reception of internal medicines at the commencement of most attacks, and throughout the whole duration of many, by the irritability of stomach forming so urgent and prominent a symptom of this familiar disease, constitutes perhaps, the most embarrassing circumstance in its treatment. It is important to inquire into its cause and origin. If it depend upon the accidental presence of undigested food or other oppressive contents, these must be got rid of. If connected with heat and burning at the epigastrium, if there be

soreness there and pain increased on pressure externally, we should apprehend the supervention of inflammation and resort at once to topical bloodletting, fomentations, mustard poultices, and after a time, vesicatories. In such cases, the mercurial treatment of which I am shortly to speak, offers the best prospect of advantage to the patient.

A vast number of palliatives or minor remedies may be found in the books and in the hands of the nurses, none of which, however, seem to me worthy of confidence. The saline draught in a state of effervescence; the alkalies, lime water especially, with or without milk; common soda water, or water merely impregnated by pressure with carb: acid gas; these are refreshing and may prove palliative. You will also derive a certain degree of benefit in many cases from small doses of anodyne, as in the pill of opium with or without camphor; minute quantities of each as in the alkaline diaphoretic formerly mentioned, with tinct. op. camphor; the acct. plumbi has been eulogized here, but it is not often applicable. Of course you will prohibit absolutely the administration of astringents, aromatics and stimulants, infusions of ginger, cloves, cinnamon, etc., with which so much evil is done domestically. Instead of allaying the vomiting and relieving nausea in inflammatory affections of the stomach, they but add fuel to fire and destroy the organ altogether.

The constipation of the early stages of fever is another troublesome contingency. Let me enjoin upon you the warning, not to hope to overcome it by increasing the doses of your active and irritating purgatives. The mildest and least offensive being selected, aid them by the use of the lancet if the strength permit; by the warm or rather tepid bath; by dashing, according to ancient custom, cold water upon the feet and legs; by large enemata, which may mechanically distend the intestines; and finally by the exhibition of relaxants, such as the tart: antimon: or tobacco, when all other resources have failed.

Hiccup is a very annoying symptom, which, by its tedious pertinacity, will sometimes harass your unfortunate patient beyond endurance, depriving him of all rest or repose. It is among our serious prognostics of evil, showing itself when the case is progressing to its last and fatal stage; but I have seen it endure five, seven and nine days before convalescence commenced, in

attacks that terminated favorably. It is difficult to relieve it. Opium, when there is nothing to contra-indicate its exhibition, and the volatile oils, turpentine and chamomile especially, have appeared to exert most control over this distressing form of partial convulsion.

Calomel has been already alluded to as the best and most useful of the purgatives employed in our autumnal remittent. In this regard, a long and multiplied experience has fully tested its value, and few dissenting voices have been raised against it in Southern regions. It is found to act with peculiar certainty upon the liver, procuring a prompt and more abundant secretion of bile. It is less likely than any thing else to disturb an irritable stomach. Nay, there is much reason for the opinion maintained by Annesley, that in its application to the gastro-enteric mucous surface, it acts as a direct sedative. Its specific influences, indeed, are not doubted or denied; but its poisonous qualities have so often displayed themselves, and so much suffering has been justly and unjustly attributed to it, that numerous efforts have been made, and are now making, to discover some other remedy, or combination of remedies, from which similar beneficial influences may be obtained without incurring similar risks. Professor Cooke, of Transylvania, suggests, with this view, a composition of rhubarb and aloes, to be made still more effective when requisite by the addition of jalap and scammony. To the two first I have no objection; jalap I seldom prescribe; scammony never. Pemberton proposes taraxacum or dandelion, which I have found safe, and indeed harmless, but of no value. Bennett recommends the tomato, a very pleasant vegetable sauce to those who are fond of acids. The specific and characteristic properties of mercury are, however, exclusively its own—inestimable, and so far as I know, without substitute. Its *modus operandi*, beyond its cathartic power, has been the topic of ceaseless and angry dispute, but is not more obscure than that of other specifics. Whether or not an immediate sedative, it is doubtless our most impressive alterant. The principle laid down by John Hunter, if not absolutely true, and universally correct, is liable to so few exceptions, that we may consider it as a rule, “that no two morbid actions can go on in the same parts or organs at the same time.” Now, in all fevers, it is

described as among the most uniform and notorious symptoms that the normal and regular action of the capillary system of vessels is disordered, impeded, perhaps entirely suppressed for a time. But the direct and obvious effect of our mercurial is displayed in its action upon this very set of vessels, which it excites and stimulates in its own peculiar mode—an effect which we can perceive and measure, in the promotion of various secretions and excretions—from the liver, the intestines, the salivary glands. It is thus the most efficient and universal of all our revulsives and deobstruents; taking off determinations to, and relieving engorgements of all organs, whether congestive or inflammatory. It is thus also that it displays its most apparent and assured opposition—a hostile or contrasted energy, if I may so express myself, to that in which idiopathic fever consists essentially. As has been observed from the earliest times of its administration, these energies will prevail alternately; the one will expel or subdue the other—the mercurial action being paramount during the remission, and yielding again before the returning force of the exacerbation, until the more vehement and tenacious finally predominates, and the patient recovers or is lost.

A considerable proportion of the attacks of bilious remittent fever are, however, manageable by a course of treatment which, while less impressive than the mercurial, does not subject the patient to the risks which, to a greater or less extent, are inseparable from this latter; and it therefore becomes important to ascertain the contingencies that are to guide us in a prudent resort to it.

If the febrile attack comes on with peculiar or evident malignancy; if the vigor of the patient, the powers of his constitution, seem obviously disproportioned to the force with which it is assailed; if the disorders of the place or of the season have put on a generally unfavorable aspect—that is, in Sydenham's phrase, if the epidemic constitution of the air be bad; if the case, from any obscure cause, obstinately protract itself, and thus threaten to exhaust the strength of the sick man; or if he seem to be sinking into that prostrate and inexcitable condition, known as the typhoid stage; under all these circumstances, you will look for aid (under Heaven) to the impressive and valuable

remedy I have not unduly extolled. The dose prescribed should be adapted to the exigencies of each case, of which the prominent elements are the apparent rapidity of progress, and the danger of organic lesion. From 2 grs. to 10 may be repeated every second hour, alternately or in combination with such other medicaments as are indicated. It is an especial recommendation of this plan, that it does not interfere with, or require the suspension of, any other appropriate remedies.

Watch the patient most attentively while under this course; desist from it, if he improves decidedly and the prognostics become favorable; if not, continue it until he complains of an uneasy sensation upon pressing his teeth together, or his gums grow thick, swollen, and tender, disposed to bleed or ulcerate, with a copperish taste in his mouth, and the well known mercurial odor of the breath, the flow of saliva being increased and offensive. To this irritative and secretory excitement of the salivary glands, the good influences of mercury in fever were formerly ascribed; but you are in no danger of falling into this error. Ptyalism is of no importance whatever, except as a token of the general condition of the system; which shows itself farther by the supervention frequently of a new type or variety of fever; with greater fulness of the vessels of the surface and heat of skin, and determination of fluids to the head generally as well as to the mouth, and to the mucous tissue of the intestines also. If the lips and cheeks and throat have been parched and dry, they are now moist and soft; if the bowels were confined, they are now moved easily and effectually; if the skin was dry, it is covered with perspiration; if cold and clammy and relaxed, its warmth and circulation are restored.

I will not deny, that ptyalism, when fully established, which however is not often necessary, is in itself a state of troublesome and annoying disease. I will not utter a word in extenuation of the calamity. It is an evil undoubtedly; but of evils, when forced upon us, it is rational to choose the least; and this is surely preferable to the continuance of a bilious remittent of the serious character I have described, as the alternative. And I declare it, after the experience of a quarter of a century, to be my deliberate conviction, that when this mercurial action has been set up in the system, the original disorder is in an infinite

majority of instances subdued, supplanted, and made to disappear ; to which, we may add the remark, that under this plan of cure, there is much less liability to relapse, as it is called, of the remittent, or to the pertinacious infliction of an intermittent visitation.

The objections to the mercurial treatment of fever, founded on its occasional inefficacy, I scarcely consider worthy of a serious answer. They only go to show, that man is mortal, and that under the present contingencies of human existence, he will die, and die of curable diseases, too, in spite of our best skill and most efficient remedies.

The evils acknowledged, however, to arise not merely from the abuse, but sometimes even from the judicious use of mercury, though prodigiously exaggerated, yet afford fair ground for another set of objections which deserve our impartial consideration. I would not subtract an iota from the due force of arguments drawn from this source. I am, indeed, anxious to have you fully aware that an agent of such potency may do much harm as well as good. I am anxious that you should be aroused to prudence and caution by an unsleeping remembrance of possible injury, such as has been inflicted not only by quacks and routine practitioners, but occasionally by skilful physicians in the employment of this powerful drug. I will confess, that it is difficult to calculate with exactness the degree of its effect ; to regulate, control, restrain, or put a stop to its irritative action on the system. Much may be done, nevertheless, by a wary and diligent superintendence of the progress of the case, and this duty being conscientiously attended to on your parts, you will not, I trust, have any reason to regret your confidence in the mercurial treatment.

Of course, the resort to it must not be made in slight attacks ; argue the matter with candor and fairness, imagining yourselves in the place of your patient, and deciding as for yourselves, whether the case is of so serious a nature, and implies so much danger to his life or future health and comfort, as to justify you in subjecting him to the annoyance of a tormenting sore mouth, with the chance of more or less injury to his teeth and their alveolar sockets ; and the further possibility of sloughing of the cheek and tongue, and death from this extension of inflammation

and gangrene. These malignant influences of the mercurial are most likely to be developed in the very young, and children, and in this class of patients, I would feel much reluctance to resort to it.

It has occurred to me to see, in consultation with gentlemen of high standing in our profession, two examples of this fatal gangrene and sphacelation. In one of these, a little girl of seven years of age, convalescence (from country fever) seemed to have been fairly set up, the gums having been moderately "touched," as the phrase is. I had left her in the charge of her original attendant, but was recalled on his observing a small black spot on her slightly swollen cheek. Sloughing took place, and she died slowly, after infinite suffering both to herself and her friends. The second was a lad of fourteen or fifteen, who while moribund, exhibited the poisonous influence of mercury previously administered. When I first saw him he was sinking fast, with a large gangrenous ulcer on the inside of his cheek. But I did not by any means attribute his death, as I did that of the little girl just spoken of, to the calomel he had taken. A blister which has inflamed the skin of a patient in the last stages of exhaustion, will occasionally sphacelate: I have seen this take place as long as five days before death. But no one thinks of ascribing the fatal termination here to the vesicatory; and the mortification of the mercurial ulcers in such instances is analogous with that of the blistered surface; each being the result of constitutional prostration.

I have thus given you, as openly and frankly as possible, my views on this warmly debated topic. To the mechanical and injudicious use of our excellent remedy, on the one hand, and on the other, to the indefinite exaggeration of unreflecting or malicious rumor, are owing most of the prejudices so widely spread in regard to it. I do not hesitate to repeat that you will find it, when prudently and appropriately employed, worthy your fullest trust and confidence.

It would evidently be futile to attempt to lay down rules for the adaptation of details of treatment, to the several varieties of form, which, under diverse circumstances and in different constitutions, may be assumed by our autumnal remittent. The principal of these is known, as I before said, by the title of "con-

gestive fever." The specific peculiarity of this dreaded disease is the centripetal tendency of the fluids of the body, the consequent engorgement of the internal organs, and the general oppression and obstruction of the vital functions which result of necessity from this vicious condition of the circulatory mass. Some bold practitioners employ the lancet here as a revulsive, or for the purpose of resolving congestion ; and the measure is certainly an efficient one, and as well adapted as in McIntosh's use of it in the cold stage of intermittents. It is full of serious risk, however, and I cannot venture to recommend it, though I can readily imagine cases in which it would be very likely to prove serviceable. And the same remark holds equally true as to cold affusion. A far safer course and equally promising, is the early resort to the warm or even hot bath, which often rouses the patient at once from his sullen languor, or relieves his sufferings from visceral engorgement. The free exhibition of the stimulant diaphoretics should follow, with assiduous application of external irritants, mustard and cantharides. Camphor or ammonia may be combined with our mercurial, and free doses of quinine administered. Indeed, our brethren of the south and west have placed their principal reliance, within the last few years, upon the sulphate of quinine, almost exclusively exhibited, and prescribed in immense doses. Congestive fever has been reported to have been successfully treated by doses of twenty to thirty, and even fifty grains of the remedy. I have heard authentically of an instance in which one hundred grains were given, in little more than twelve hours, and of another, in which half the contents of an ounce bottle were administered during a similar period. I have as yet met with no attack which required such enormous amounts. I will not dispute their necessity or propriety ; of which indeed time and an enlarged experience must constitute the true tests. Unless the drug, as thus employed, is strangely adulterated, evidence enough has been offered to prove that the danger of these large doses has been grievously exaggerated. Turpentine and capsicum are used freely here by many, and it is said with the best effect. The Dovers powder determines well to the surface, and, unless where there is coma, seems appropriate to our purposes. Many of these congestive cases resemble, from the first, or readily run into a typhoid condition,

with abdominal irritation—diarrhœa, tenesmus, meteorism. I have found, in such instances, denominated in some parts of our state ilietis, the nitrate of silver productive of benefit. I prescribe the sixth or fourth part of a grain every three hours, without allowing it to interfere with such other remedial measures as may be indicated.

In the malignant remittent, occasionally met with and formerly described to you, the vital forces, rapidly crushed by the overwhelming intensity of the morbid cause, fail apparently to exhibit any resistance or reaction. They must be sustained by every means within our power, while we have immediate recourse to our most impressive revulsives. The hot bath, sinapisms, vesicatories, must be quickly and assiduously applied, while we stimulate by the freest use of internal remedies, carefully selecting such as are best adapted to the circumstances presented. If, as is often the fact, the patient suffers severely from pain in the abdomen or chest, large doses of opium or morphine must be administered, while we keep up his sinking strength by brandy, ammonia or æther. In your diligent superintendence of such cases, make it a rule rather to incur the risk of over stimulating transiently, than fall below the requisite point of excitement in your use of stimulants. I am fully persuaded that I have seen more than one man die from the timidity of his physician in this respect; who, keeping at a cautious distance behind the disease, would not venture on the exhibition of any excitant adapted to the feeble excitability, until the vital energies upon which alone stimulants can act, had become worn out and exhausted.

If the stomach will bear it, add to your formula some of the preparations of cinchona. The sulph: quinine in full doses will be often retained and do good. Alternate, combine, and recombine your stimulants, which may perhaps be aided also by warm and nutritious fluids, wine whey, arrow root with wine, wine alone or spiced, brandy with milk or in mucilage. These energetic agents will usually be found effective within a very short period, improving the pulse and arousing the general powers of the system. Yet you must not permit yourselves to be disheartened into inaction by their apparent inefficacy or slowness of impression. Persevere not only while there is a reasonable hope, but even after all hope seems extinguished; and though your hearts

will now and again be wrung with painful disappointment, by the feebleness and inutility of your remedies, yet you will feel yourselves amply repaid by the gratification, which will not be denied you, of saving more than one fellow creature from the destruction which seems inevitably to await him. Instances of such recovery do occur, though rarely, and bear honorable testimony to the skill and unwearied humanity of the physician. They display too, the excellent powers of our medicaments, the capacity for endurance inherent in the human constitution, and show forth above all, the unspeakable benevolence of the Former of these wonderful though frail frames.

In the bills of mortality for the city of Charleston, you will find every year a certain number of cases distinguished by the appellation of "country fever." The phrase is employed to denote the febrile attack which follows within a short time, and with appalling certainty, an exposure to the concentrated malaria of the low country in our immediate vicinity. To sleep a single night upon his plantation, involves the southern agriculturist in the most serious danger; nay, he is not safe if he indulge himself in frequent visits, even by day, to his rice fields, or inhale too often under any circumstances, the pestilential air of our swamps and marshes.

Country fever, using the term as above defined, is a very instructive and interesting variety of fever, exhibiting in a very striking manner the tendency of the several types which have a miasmatic or paludal origin to mingle with or run into each other. Through the progress of a given case you may indeed, have each of them in turn presenting itself. An attack commencing as intermittent, or single tertian, will thus become a double tertian, then a triple tertian, then a remittent of greater or less distinctness and regularity; if successfully managed it may become again intermittent by restoration of the apyretic interval; if otherwise it prove violent and tenacious, it is not rare to see it degenerate into that low and typhoid condition in which the remissions becoming irregular and uncertain, and indistinct, it approximates at least, if it does not assume the continued form.

As early as May, in ordinary seasons, attacks of country fever follow the exposures above pointed out. I have known a few, even in April, ascribable perhaps, to some uncommon contingencies.

The period of their appearance has, undoubtedly, a reference both to the temperature of the past winter and that of the advancing spring—a cold winter and a late spring being unfavorable to the invasion. Much also, is owing to the habits and constitutional predisposition of the subject exposed, who is especially liable to be assailed if imprudent or intemperate, or a subject of fever the year previous.

It has been a long received opinion that a return to our comparatively healthy city atmosphere, the ordinary summer residence of so many planters, during the latent period which ensues after efficient exposure as above described, endows the coming attack in some obscure manner with a peculiar violence and malignity. The type assumed, as I have stated, is apt to be irregular, confused and complicated. We meet frequently with the herosthesis of the ancients, recognized, as I formerly mentioned, by Robert Jackson—an accumulation of unexpected paroxysms or exacerbations one upon another, or an exacerbation *interposed* at the most unlooked for period of the day, just when a remission was anticipated, and both patient and physician were congratulating themselves upon the prospect of a brief but solacing respite.

It is a most insidious modification of fever, requiring to be watched with the greatest attention and assiduity. The sick man will often make little complaint, his symptoms will appear mild, and yet you will perceive that he gets steadily weaker and worse; or the remission shall have become very distinct, nay, shall amount to complete intermission, and you flatter yourself with the hope that convalescence is begun, when some single paroxysm shall intervene with such overwhelming violence, that prostration and fatal exhaustion ensue in a few hours.

In the difficulty of accounting for this strange assumption of malignity under the circumstances, it has been argued that these modifications were determined by the peculiar state of the city atmosphere in relation to its capacity for producing the more pestilential grades of fever, as it is well known that cities are the exclusive sources of yellow fever and of the plague; and it is thus attempted to be explained why we also meet in the suburbs with similarly modified fevers. As regards Charleston Neck, the remark holds good—fevers originating in this mixed

atmosphere very often partaking of the dreaded characteristics of country fever. But there is an insuperable difficulty in the way of this suggestion, in accordance with which we should find the bilious remittents of the city itself severe and fatal. The fact is notoriously otherwise. Here, they are indeed both infrequent and comparatively mild and manageable, as formerly stated to you.

Besides this, a similar aggravation of violence and danger is affirmed to occur every where, when a subject efficiently exposed to the influences of febrific miasmata, has removed during the latent period to a pure and salubrious atmosphere. This is true, as Flint tells us, of the upland prairies of the far west, and as I have more than once had unhappy occasion to note, in our own lofty mountain regions.

The prognosis in such cases you will at once infer to be very doubtful; nay, it is hardly safe to regard your patient as better until he is quite well.

The treatment also requires to be managed with great diligence and nicety. Frequent visits are absolutely necessary, and with all possible watchfulness and assiduity, you will still be liable to fall into serious errors. It is exceedingly difficult to distinguish in the early stages the most unimportant attack from the most dangerous. Hence it has become my custom to look upon all such seizures with a jealous eye, and to institute from the commencement such a course of treatment as shall offer the best resources under any sudden development of malignity or aggravation of violence. Under these circumstances too, I watch anxiously for the first opportunity of administering some preparation of cinchona—the infusion in some of its combinations, or the sulph: quinine in proper and efficient doses. The system sinks so readily under such exacerbations or such accumulation of them as I have above alluded to, that I often venture upon the exhibition of this class of remedies, even in remissions somewhat indistinct and obscure, after the first vehemence of febrile action has passed by, and the appropriate measures of depletion have been premised.

I have very rarely observed any evil results follow this practice; its worst consequence, if not most injudiciously timed, nor pressed obstinately against contra-indicating contingencies, will

be an increase of violence in the next exacerbation ; but to compensate for this, the succeeding remission will rarely fail to be more distinct and better adapted for the use of our febrifuge, and thus the disease is made to yield more readily than under any other course.

The convalescence from bilious remittent is occasionally slow, tedious, and interrupted with annoyances that require the attentive observation and judicious interference of the physician. We shall not be surprised at this when we reflect that the invalid is still surrounded with the atmospheric influences to which we attribute the disease that has assailed him ; and that the several organs which have suffered from the concussions of fever must continue for a time enfeebled and irritable, and in a greater or less degree incapacitated for the resumption of their ordinary functions. As the abdominal viscera have chiefly borne the onus of morbid action, so they are most likely to continue disordered. There is apt to be costiveness on the one hand, or on the other a disposition to diarrhœa. Sometimes we have to contend with an uncontrollable appetite which runs far beyond the powers of digestion ; at others there is prolonged anorexia with gastric languor and inactivity. Jaundice occasionally presents itself, or there may be entire torpor of the liver with whitish or clay colored stools ; the muscular debility of the patient remains in some instances so long and exists in such degree, as to excite fears of spinal affection and consequent paraplegia, which indeed I have known in one or two instances. Added to all this there is a notable proclivity to relapse, or recurrence of the scarcely vanquished malady, or the supervention of a troublesome intermittent. To conduct the invalid safely through all these obstacles and difficulties, will often require on your parts, great vigilance and sagacity.

A mild laxative if the bowels are constipated, the tinct: kino or some other astringent if too loose, an occasional blue pill at proper intervals if there be hepatic obstruction or derangement, with the use, perhaps, of some of the bitters or mineral tonics, of which the preparations of iron are generally preferable—these will form the brief catalogue of prescriptions which it may become necessary to administer. You will gladly abstain, if possible, from all exhibition of medicines, while you observe great

delicacy in the regulation of regimen and diet. The appetite is usually strong enough, and may indeed require to be restrained, as undue indulgence in this respect has often produced injurious, nay, it is said, even fatal consequences. It has been disputed whether fluid or solid, animal or vegetable food is best adapted. I allow myself to be guided much by the patient's habits in health, and his ordinary mode of living, restraining the quantity of every thing taken within strict limits. For the most part, fluid or semi-fluid farinaceous articles agree best at first; then thin soups or broths, and after a short time, the lighter meats very plainly prepared. If the appetite be defective or irregular, a little sound old wine, sherry or madeira, may be allowed, or at the patient's choice, a little porter or ale.

One of the earliest symptoms of recovery is apt to be shown in the disposition to sleep, calm, tranquil and refreshing sleep; but the convalescent is sometimes troubled by a morbid vigilance, which, if suffered to vex him long, will be likely to usher in a train of unpleasant consequences. A well timed anodyne will obviate all these. If opium do not agree, cicuta or hyosciamus may be substituted; the tinct. of hop, the hop pillow and lactucarium are recommended and may be tried.

After all, however, the best of our tonics, the surest means of restoring a regular appetite and good digestion, and of obtaining sound and refreshing sleep is exercise, allowed in proportion as your patient can bear it. His muscular strength will suffice, at first, for nothing more than mere change of position in bed, or of place in his chamber, but will increase rapidly with this use of it. The exercises of gestation will soon be borne without inordinate fatigue—swinging, sailing, riding in a carriage, and finally on horseback. There is nothing comparable to this latter as a promoter of appetite, of bodily and mental vigor, and profound and sweet repose.

If the case was such as to have required the mercurial treatment, and pyalism has occurred, you will find the sore mouth an obstinate and grievous annoyance; to remove which, is a problem of very difficult solution. Time would fail me in the attempt merely to enumerate the various means of cure proposed. Ice, and other sedatives, acet. plumbi, borax, etc. are recommended on one hand—warm infusions, nay, even steam, tar

water and turpentine on the other ; astringents of all kinds are employed, mineral and vegetable—bark, green tea, the mineral acids, the sulphates of zinc and copper. The hydrosulphuret of potass is highly spoken of by some German writers. Hosack and others have resorted to emetics, frequently repeated ; but this remedy seems worse than the disease. Vesicatories applied to the back of the neck and behind the ears, may do good as revulsives.

I prefer to enjoin upon the sufferer merely the necessity of frequent washing of the mouth, for the sake of nice cleanliness, and this may be done with laudanum and water, which perhaps diminishes somewhat the irritability of the ulcerated surfaces.

With all these seemingly multiplied resources, however, you will often be baffled and defeated in your endeavor to alleviate the inconveniences and vexations of ptyalism ; nothing then remains but to remind your convalescent of the far more serious and permanent evils for which this has been made, with all its tenacity, a comparatively transient substitute ; and to recommend to him the exercise of a becoming fortitude and resignation.

I should have mentioned as one of the earliest steps to be taken at the commencement of your patient's recovery, the removal from his chamber of all the paraphernalia of the sick room ; all the cups, phials, etc., etc., which the tender assiduity of female friends, and the necessity of circumstances may have accumulated about him ; and which of course have become highly disgusting and revolting to him, by the painful associations with which they are connected. Admit as much light as his eyes can bear without pain or irritation, so as to make the appearance of his apartment as cheerful as possible, and to contrast as strongly as may be with its preceding gloom.

His friends, on visiting him, should be cautioned against entering into conversation upon any specially interesting or exciting subject, nor should he be allowed to converse much or long on any topic. His spirits will be depressed ; every effort must be made to amuse and enliven him. If a man of active habits, his time will hang excessively heavy on his hands ; and all ingenuity must be exerted for the purpose of passing it pleasantly and imperceptibly away.

Finally—let him return gradually, as his improving strength

may allow, to his accustomed mode of life and his usual vocations, but for some time to come, he must avoid the intricate entanglements of complicated or disagreeable business.

CHAPTER VI.

INFANTILE REMITTENT.

I PROCEED next to treat of that form of remittent fever which, appearing in young subjects only, has received the appellation of Infantile Remittent, or the remittent of children; and from its being often attended by or complicated with the tokens of verminous irritation, has been ascribed by the common people and by some physicians, exclusively to the presence and undue number of intestinal worms, and hence familiarly called Worm-fever.

As to its source and origin, however, there is much difference of opinion. While the popular notion of its nature and cause has received the support of many respectable practitioners, there are not wanting those, on the other hand, who deny entirely the agency of worms in its production in any case. Of these Dr. Butter stands first, and is regarded as weighty authority. Dr. Rush sides with him unhesitatingly, and indeed maintains that these parasitic animals, so much dreaded and denounced, are at least innoxious, if indeed they are not useful and serviceable in the human economy. Dr. Hunter declares that he has in vain searched for them in the bodies of children who had died of this type of fever; and Good goes to the unwarrantable length of asserting that "there is no instance on record of their having been traced in such bodies." The Italian Brera is disposed to consider "what have been denominated worm-fevers, as in reality low fevers—gastric and adynamic—during which worms multiply and grow in those parts of the body that are most enfeebled."

This latter view of the subject is plausible, and has been readily adopted, as offering a sort of compromise between opposing authorities, and explaining facts apparently contradictory. Never-

theless, there is not a doubt in my mind that the irritation occasioned by the presence of intestinal worms upon the mobile constitutions of children, is fully capable of developing this form of fever, nay, that it is by no means an unfrequent cause. You will often succeed, by the employment of proper remedies, in procuring their expulsion in considerable numbers early in the attack, so early as not to admit of the explanation suggested by Brera. You will find them coming away at all its successive stages, and their removal or the subtraction from their numbers will always be followed by obvious relief; sometimes indeed, by sudden and entire cure. In reply to the definite, but erroneous positions of Hunter and Good, I will affirm that I have repeatedly seen them in masses in the intestines of children who have died of this fever.

Yet we must by no means run into the opposite extreme, as some have done, and attribute this infantile remittent to verminous irritation as its exclusive exciting cause, nor perhaps even its most general or ordinary source. Any species of gastric or intestinal derangement, any disorder of the chylopoietic viscera, may give rise, under certain contingencies, to the same concurrence of symptoms. Fruit eaten unripe or decayed; ill cooked vegetables; unwholesome bread; salted meats, and indeed bad diet of every sort, will produce it. I have seen it as the result of a neglected, dirty condition of the clothes and skin of a child, and of confinement to a close ill-ventilated sleeping apartment.

We usually meet with this variety of remittent in subjects between three and twelve years of age—a period, during which, for whatever reason, worms are apt to be most numerous and troublesome. The earlier symptoms are those of derangement of the digestive organs. The appetite is observed to be irregular and uncertain—either morbidly voracious or entirely wanting; the bowels are sometimes costive—at others, there is diarrhœa, with ill-looking, offensive mucous stools, passed with griping and tenesmus; the tongue is foul and thickly furred, sodden, swollen and indented, and the breath particularly fœtid. The patient is restless, and the nights uneasy and disturbed; the skin is hot and dry, with much thirst and a pulse frequent, jerking and irregular; as morning comes on, the febrile symptoms abate, with or without sweating, and the child sleeps, perhaps

very soundly and heavily—or, as is more commonly observed, with much starting and muttering and grinding of the teeth.

As the disease progresses, the tokens of abdominal disorder increase in intensity; there is constant pain in the belly, which is swollen and tense—sometimes full and hard, and at others, elastic and rebounding; the tongue becomes fiery red, and is covered with small ulcers, spreading over the lips and the corners of the mouth, which are obstinately sore; the nostrils are inflamed and affected with incessant itching, whence the habit arises of perpetually rubbing and picking the nose; the skin of the face, and especially of the eyelids, is puffed and of a transparent paleness; the extremities are tense, with a soft, pale swelling.

Cerebral determination frequently becomes prominent in these latter stages; a light delirium shows itself, with screaming at intervals—or stupor ensues, with coma and strabismus, and other concomitants of hydrocephatic effusion. Convulsions ultimately supervene, and death soon follows.

An American writer of high reputation, lays down as a diagnostic of this form of fever, which he treats of under the title of Worm fever, “that the exacerbations are always attended with heavy drowsiness, and the remissions with morbid vigilance.” This is not uniformly so; perhaps the majority of cases would rather furnish grounds for the statement made by Good, who mentions it as “a singular fact, that if the exacerbation take place in the night, there is wakefulness and jactitation; if in the day time, drowsiness and stupor.” I would not, however, venture to affirm, with either of these authorities, such a regular and invariable correspondence between the state or stage of fever and the disposition to vigilance or sleep. The contrary might, indeed, seem to be fairly inferable, from the inconsistency of their observations; and, accordingly, I have seen, in different cases—nay, even at different times in the same case, drowsiness in remission and exacerbation, coming on by day and by night promiscuously.

I am not inclined, as some have been, to confound this disease with our autumnal malaria fevers, although it is of most frequent occurrence here during the summer and fall, owing probably to the quantities of fruit then obtainable by children, and devoured

by them in an improper condition, half ripe or half decayed, and very imperfectly masticated. I have met with it perfectly well marked in all the months of the year; and it is known, not unfamiliarly, in situations where the influence of malaria is altogether unperceived.

It claims to be ranked properly among remittents, by the distinctness or degree of abatement of the febrile symptoms, and the duration—the proportionate duration of this abatement. It is not regular or calculable in its time of access, invading sometimes at noon, but most usually in the evening or at night. The exacerbation does not often last longer than from nine to twelve hours.

Autopsy. I have already mentioned the presence of great numbers of worms in bodies dead of infantile remittent. I have seen the intestines literally filled with them. The mucous surface exhibits every effect of irritation produced by them, from simple redness to ulcer and perforation. The bowel is sometimes found contracted here and there, and thickened in substance, and intus-susceptions not unfrequently met with. The mesenteric glands have been found enlarged and indurated; the liver and spleen engorged, augmented in size, and harder and heavier than natural.

The general Prognosis is favorable, and the proportion of deaths small under proper care. Special danger in any case, is shown by the prominence of all tokens that denote actual inflammation of the abdominal viscera, such as great tenderness on pressure, with large swelling or tympanitic tension. Dysenteric stools are unfavorable signs. The supervention of cerebral disturbance is also menacing, as shown by frequent screaming, or violent delirium, or by strabismus, coma or convulsions.

Treatment. The view which has been taken of the nature of this form of fever, and of its causes, will point out the course necessary to be entered upon. The prompt administration of an active cathartic is indicated too plainly to allow of any dispute or hesitation. Calomel is in every way entitled to be selected, but its operation must be hastened by combination with some quicker article. We may choose, for this purpose, either rhubarb or castor oil—or, if we have reason to suspect the pres-

ence of worms, some one of the numerous class of anthelmintics may be added. I am satisfied, that it is not safe to trust the patient exclusively to the action of the neutral salts, so highly eulogized by Dr. Butter. The bowels are often torpid, loaded and clogged with foul, tenacious mucus, and other viscid secretions, which must be brought away, and this complete and effectual evacuation of the alvine canal can only be effected by means of the oily and resinous purgatives. The stools, from the neutral salts, are thin and watery, and if we urge them long, we shall bring on with them severe griping and harsh irritation, before we succeed in expelling the worms which may be present, or their foul nidus, the morbid secretions above alluded to. The discharges which give most relief to the patient, and seem productive of most permanent benefit, will be noticed to be of some consistence, dark greenish probably, or even black and highly offensive.

The anthelmintics which I prefer to employ in the case before us, are the *spigelia marilandica*, camphor, and the spts: *terebinth*. Concerning the first of these, I will remark, that its usefulness here does not by any means seem to depend exclusively upon its vermifuge properties, at least, so far as these are displayed in the expulsion of worms. I have often seen the most decided advantage from its exhibition, when not a single worm was discharged, and when, indeed, there was no definite proof of their presence. Perhaps, it may have some beneficial effect as a narcotic, in diminishing the irritation and irritability of both the intestines and the general constitution. Its action in this way requires, however, to be watched and regulated; in an over dose, it will determine dangerously to the head, occasioning tremors, starting, vertigo, blindness, dilatation of the pupil and convulsions.

The spts: *terebinth*: is a very efficient addition to the common domestic cathartic, castor oil, an article of infinite value in the management of the diseases of children generally. If properly employed, there is no reason to dread from turpentine that acrid and unduly violent operation, the expectation of which has induced so many to avoid or neglect it. I have found it, in the combination just mentioned, rather a mild than irritating purga-

tive ; and in the hands of many reporters, it has been declared not only safe, but particularly beneficial in numerous pyretic and inflammatory affections, as metritis and peritonitis.

Camphor, in small doses, may be serviceably mingled with all of our formulæ. Its aroma is, doubtless, as disagreeable to the parasitic vermin aimed at, as it is pleasantly cordial to the patient ; it acts also as a tonic and diaphoretic. Its use may be continued through the several stages of convalescence, in which it is supposed to prevent a return of the verminous irritation by preventing the increase of the troublesome animals. With similar views, the infusion of the bark of the root of our Pride of India tree, the *melia azedarach*, is often prescribed ; it is a good tonic as well as an approved vermifuge.

During the attack, and in all its stages, we shall find the frequent employment of the warm bath a remedy of much importance and value. It determines well to the skin, tranquilizes the disturbed stomach, and procures refreshing sleep. Warm poultices, sinapisms and fomentations should be applied to remove local determination to the chest or abdomen. If directed to the head, the affusion of cold water upon that part, from some little elevation, will be found efficient as a means of relief ; and should be promptly resorted to, and repeated as often as occasion may demand.

Diarrhœa sometimes appears early, and is disposed to continue long. It yields, perhaps, to a proper dose of calomel with cret: ppt: and a small amount of Dovers' powder ; but, if obstinate, must be restrained by astringents and anodynes. The cretaceous mixture with the tinct: kino will rarely fail to check it ; after which, we may employ some alkaline solution with the tinct: opii camphorata. The good effect of these will be hastened by the administration of mucilaginous enemata with tinct: opii in small amount.

As soon as an intermission of fever occurs, cinchona should be resorted to ; and if the case be protracted, I would not wait for an intermission, but take advantage of the period of remission for the purpose. The little patient will take quinine very reluctantly, if at all, but the infus: of cinchona et seipentaria may be made less disgusting by the addition of some alkali and aromatic, and should perhaps, on this account be preferred.

During convalescence, the diet should be light, plain, easily digestible, and cautiously limited in quantity. The utmost attention to cleanliness of person, clothing, bed and chamber, must be enforced strictly and permanently enjoined.

If the convalescent be very young or specially thoughtless, the superintendence of some intelligent nurse will continue to be required, in regard to the control of his appetite and the general regulation of his habits.

CHAPTER VII.

CONTINUED FEVER.—YELLOW FEVER.

A CONTINUED fever, in the strict meaning of the word, is said in some of your books, never to be met with. But it is hypercritical thus to object to the phrase, as if it were intended to imply an exact uniformity in the progress of a fever, and an unvarying equality in the degree of excitement present in all its stages. The distinction aimed at, is pathologically proper, and practically useful, and ought to be retained.

The class of continued fevers may be defined, so as to include those which run their course without any such abatement or relaxation of the symptoms as shall notably affect the condition of the patient; their remissions, as they are called from analogy, and in compliance with custom, being unimportant in degree, uncertain in period of access, and transient, or varying in duration.

I have dwelt upon the relation which seems to exist between our bilious remittent and the tertian type of intermittent; writers have affirmed a similar correspondence between the continued and quotidian; and the remark doubtless has some foundation in truth. The abatement of intensity of symptoms in the class we are now considering, when noticeable at all, occurs for the most part in the morning; the exacerbation commencing early in the forenoon gathers strength throughout the day, and

arrives at its maximum in the evening; beginning to decline perhaps, at or about midnight, with more or less inclination to sleep, and usually a slight moisture of the skin. Every individual of the class is, however, so marked and distinguished by its own peculiarities, that we must describe each separately, to give any just and proper views of the subject.

YELLOW FEVER.

The nature of this disease, and the name by which it ought properly to be designated, have been matters of infinite dispute; and in this conflict of sentiment each writer has given it the title best suited to his own views of its origin, history and character. It derives from Cullen its cognomen of Typhus icterodes, expressing very well the light in which he regarded it, as a fever essentially of a low form, modified by derangement of the hepatic function. Armstrong has also made an effort to establish its pathological identity with Typhus. Mosely, with directly opposite impressions, considers it to be the true Causus, febris ardens, burning fever of the ancient writers. Pym styles it the Bulam fever, from its supposed origin in an obscure island at the mouth of an African river. Virey mentions it under the appellation of "the Kendal fever." During the short-lived sway of the Broussaian doctrine of the gastro-enteric location of fever, it was spoken of as a gastro-duodenite, the stomach and duodenum being prominently assailed in its progress. The French West Indians know it as la fièvre jaune, fièvre matelotte; the Spanish Americans call it, from a striking symptom, vomito negro, vomito prieto.

The orange hue which tinges the skin and eyes in so very large a proportion of the cases, earlier or later, has given it the appellation by which it is so familiarly known among us, under which it will not fail to be universally recognized, and which I have therefore retained.

Most of those who have met with this malady regard it as a distinct form of fever, and attribute it of course, to the agency of peculiar and specific causes; among which, contagion is enumerated, and has been dwelt on by Pym, Fellows, Blane, Hosack, and

Monette. Others, with Rush and Bancroft at their head, consider it merely a malignant form of autumnal remittent, arising from the usual sources of intermittents and remittents—malaria in its various modifications, the effluvia from decaying vegetable matters.

Good, while he classes it with remittents, calling it Epanetus malignus, prefers, as he says, the trivial adjunct yellow to that of paludal fever, because he believes that it may arise as well from contagion as from marsh miasmata.

Yellow fever is a distinct form of continued fever, consisting specifically of but one paroxysm; this may and does vary notably in duration, but whether long or short is never repeated; it is always single. The proofs of this doctrine are abundant. Rush, while describing the yellow fever of 1797, in Philadelphia, speaks of its analogy with the malignant state of small pox, and observes, "The fever in both continues for three or four days without any remission." Lining, in his graphic pourtraiture of the disease as it prevailed in this city, employs language that does not admit of mistake; the uniform accuracy of which, for the last twenty-five years I can vouch for. Dr. McArthur, after having six years the care of a public hospital in the West Indies, declares positively, "I have never noticed a remission during the whole course of the fever." The more recent testimony of Wilson to the same effect, is also absolutely unequivocal.

The apparent exceptions to the rule thus laid down, may I think be readily explained and fairly accounted for. 1. The single paroxysm of which we have spoken may, and does often sink the system irrecoverably and terminate in death; or on the other hand, it may and does pass away, leaving the patient to prompt or progressive convalescence; or, producing an intermediate amount of influence, it may reduce the constitution to a state fitted for the invasion of fever of uncertain type, varying according to the nature of the injury inflicted. Such febrile irritation, as truly consecutive and sympathetic as the secondary fever of small pox, or the hectic attendant upon suppuration of the knee joint, may arise from ordinary visceral obstruction, as of the liver and spleen, the consequence of the violent tumults of the first stage and the derangement of the secretory function

and organs thereby produced; or it may result from a degree of chronic inflammation remaining in some of the tissues that have been subjected to violent vascular determination.

2. The consecutive invasion of fever, which some describe as a returning exacerbation, and others have imagined to be "a relapse," so far from constituting any portion of the disease upon which it has supervened, stands in the same relation to it as diarrhœa to preceding measles, or dropsy to the obstinate intermittent or scarlatina which caused it. This sort of re-action, following the terrible exhaustion to which the patient has been reduced by the paroxysm or first stage of yellow fever, may even become a favorable accident, and add something to the chances of recovery. In the history of the Andalusian epidemic of 1820, from the pen of the venerable Robert Jackson, a man worthy of the highest professional honor and esteem, this remark occurs. "The course of the attack appears to be sometimes suspended about the fifth or seventh day, by a stream of life thrown into the system at those times in a manner that cannot be explained, but that tends, by the new action produced, to avert death. The circulation from drawling and sluggish, becomes buoyant and active, the tongue assumes a white and furred appearance, in short, a new train of febrile movement takes place, runs a given course, and terminates after a short duration, sometimes favorably, sometimes otherwise."

3. The error has been most plausibly based upon the actual intermingling of the types of fever in malaria climates, their supervention upon one another. In any of the localities where yellow fever is endemic, a remittent or intermittent may at any stage of its progress assume the malignant character of the prevailing pestilence, locally epidemic. I have seen this happen repeatedly. In the summer of 1817, many northern and foreign sailors had been induced to go as boatmen up our rivers. Considerable numbers of them were brought into our hospitals with country fevers, both remittent and intermittent, which, as soon as yellow fever became prevalent, ran into that epidemic—the fever becoming continued, and black vomit ensuing. Dr. McArthur tells us that many "cases of remittent fever under his care terminated in the endemic of yellow fever."

It is fairly to be inferred from the records that such was a very

common fact in the earlier history of the yellow fever of Augusta, Geo., in 1839. The specific cause of this new malady, when introduced there, was of course mingled with the abundant malaria of the place and season, and until its influence became paramount, and in a certain sense exclusive, the effects of the two seem to have been combined. Hence the uncertainty at first expressed as to the nature and type of the disease.

An inquiry into the causation of yellow fever and the conditions which limit its endemic localization, and foster its epidemic extension and prevalence, will assist us materially in the effort to assign it a correct place in our pathological nosology, and to separate it from those other forms of fever with which it has so often and as I think so mischievously been confounded.

Nothing seems to me more trifling or illogical than the attempts every day repeated—usque ad nauseam—to account for the production of this malady by reference to influences and contingencies of local and limited power, and of transient application. I surely need not tell you that we have not yet detected its palpable sources, nor remind you that the discussion of its probable origin is surrounded with difficulties. In ascribing it as is the present fashion—to the continued operation of heat, malaria, animal and vegetable effluvia, we are totally unable to explain why these causes acting together do not generate it as well in Calcutta as in Vera Cruz; in Milo as in Havana; in Jerusalem or Naples as in Seville or Charleston.

If we attribute it to contagion, and contend that it is thus transported across the Atlantic, we are embarrassed with the question why it so rarely extends itself around its known centres even a few miles, as from Charleston to Columbia or Wilmington.

As to the alleged sufficiency of malaria to generate yellow fever, the question is easily disposed of. Dr. Lining early remarked, concerning the disease when epidemic here, that it was exclusively confined to the city; from whence, he infers fairly enough, that some essential condition was wanting in the country which was present in town. This he believed to be contagion or infection, as he calls it. Bancroft ludicrously breaks out into a triumphant but blundering commentary.—“The advocates of contagion in America,” he says, “when embarrassed by the well known and admitted fact, that the disease never spreads

in the country, pretend that the air is there too pure, which is doubtless true, if by purity they mean that it is not sufficiently charged with miasmata to produce fever." His imagined argument and his reply are alike factitious, and show a complete ignorance of our local statistics. Our low country air, so far from being too pure for fever, we know to be saturated with febrific miasma; but this miasm never generates yellow fever. Even in the city, where the malaria that gives rise to bilious remittent, is sometimes active during the existence of yellow fever, their concurrence forms the exception and not the rule.

This remark was long since made here by Irvine, and by Rush of Philadelphia.—In looking over our bills of mortality, the yellow fever years are not distinguished by any increase in the deaths from malaria fever, which ought to be the fact on Bancroft's supposition, but very strikingly the reverse. They have prevailed together but twice in the last quarter of a century, viz. in 1827 and 1835. On the contrary, the summer of 1824 was one of terrible pestilence with us in the city; but there were no bilious fevers, and the surrounding country was healthier than usual. I say no bilious fevers, for the number of deaths from it, recorded upon our bill of mortality, is smaller than on any other that I can find. The same thing is true of 1828, when dengue preceded yellow fever. In 1837–38–39–40, we had yellow fever, but little or no bilious remittent. Here, then, the line of distinction is broadly drawn, for here we have always subjects in abundance for the two forms of fever, their causes concurring as in 1827 and 1835. A native will be seized, on exposure, with bilious remittent, and a stranger with yellow fever. Elsewhere, the apparent contrast might be ascribed to an exclusive or paramount agency of a more intense or malignant vehemence of the generative cause, which, it is clearly evident, is not even supposable here.

It is matter of notoriety, that yellow fever shows itself almost exclusively in large commercial towns on the sea-coast or the shores of navigable rivers. Hence arose very naturally the idea of its importable and contagious nature, which, you are aware, has been the topic of such prolonged and angry dispute. With regard to our own immediate interest in this question, it is lessened by the universal admission, that the disease may originate

here. The facts which go to prove its local production as an endemic of our city, are too numerous and clear to admit of a reasonable doubt. It is true, that Dr. Lining, who saw it four times epidemic here, ascribed it, in each instance, to importation from the West Indies, and "the influence," as he phrases it, "of infectious miasmata." But as early as 1749, Dr. John Moultrie, in his inaugural dissertation, published at Edinburgh, declares his dissent from those views, and attributes the epidemic of 1745 distinctly to domestic sources. In 1800, we find our historian, Dr. David Ramsay, affirming that "the physicians and inhabitants are agreed in the belief, that the disease is neither imported nor contagious. This," he goes on to say, "was the unanimous sentiment of the Medical Society, who last summer advised the government that the rigid enforcement of the quarantine laws was by no means necessary on account of the yellow fever." A complete change had thus, within half a century, been wrought in the opinions of the community on this subject, and the unanimity spoken of, remained undisturbed until very recently. Yet, it must be allowed us to ask, whether there is not error in both these extremes—and error, which can never be safe, is, in this matter, specially dangerous. We are, indeed, unhappily independent of any external source for the existence of this malady, which, under certain contingencies not clearly pointed out, may be generated in the midst of us. It is believed, however, that we are aware of the fostering influence of some circumstances which favor its production, increase the chances of its invasion, and enhance its violence and malignity, and the extent of its prevalence. If its cause be perpetually present, the very point of most interesting enquiry, it is not always or annually active or efficient. Some of our summers pass by without offering any example of the disease, and many without its prevailing in any notable degree. How unwise to diminish the hope of this escape, year after year, by admitting any relaxation of quarantine restrictions. I would not place any undue reliance on the present absurd and inconvenient system, which, nevertheless, is rather better than none at all; nor to the abandonment of, and non-intercourse with the miserable sick—an useless and unpardonable inhumanity. But I would keep up a rational supervision of the commerce with infected sea-ports,

while I bent a steady attention to the internal police of the city; hoping much from the protective exertions of our Board of Health, the industry of our scavengers, and the kind and providential dispensation of storm, sunshine and rain.

The merits of the general question of the contagiousness of yellow fever, have been ably argued—on the one side by Pym, Fellows, Blane, and Audouard, and, on the other, by Bancroft, Johnson, Ferguson, and a host of considerable names in Europe. Among our own countrymen, we shall find the authorities pretty equally divided. Rush held, during his life, both opinions, and it is said to be doubtful in which faith he died. Moultrie, Physick, Warren, Millar, and Irvine, are non-contagionists. Opposed to them, are Wistar, Townsend, Hosack, and Monette. The first gives us a history of ten cases, occurring in the healthy village of Germantown, and traceable to communication with a patient from the neighboring city of Philadelphia, where the disease then prevailed, in 1798. From Dr. Monette, of Washington, Miss., we have a very full and able series of papers to show the extension of the pestilence from New-Orleans to the several cities on the Mississippi on divers occasions. Dr. B. B. Strobel, of this city, struck with the early and unexpected appearance of yellow fever here in June, 1839, was led to a patient, impartial and attentive examination of the subject. For the detail of his facts and arguments, I refer you to his published work. They seem to me weighty, if not conclusive; and if they do not prove, they surely render highly probable the doctrine, that yellow fever is, in this country and climate, as it has long been maintained to be elsewhere, contagious and communicable, or, as Dr. Strobel has phrased it, “transmissible.”

We may now, I think, condense all that is clearly known of the generation of yellow fever in the following propositions:

- 1st. This malady is the effect of a specific and peculiar cause.
- 2d. In certain localities, this obscure cause is permanent and always active; in others, it exhibits only an occasional activity, by which alone its presence can be inferred. In Vera Cruz, Havana, Kingston, it is perennially endemic; it is occasionally so in New-Orleans, Mobile, Savannah and Charleston; which last city seems to be placed upon its extreme northern limit of spontaneous production.

3d. Its relation to season and temperature is equally well made out ; being efficient only during the hot months of summer and autumn.

4th. Yellow fever is contagious ; in other words, a case of yellow fever having been generated in favorable season and locality, by its unknown and undetected cause, becomes itself a generating centre productive of other cases, or of a morbid agent capable of producing them.

5th. It is transmissible from any one centre to another, or from any one of its generating centres to a healthy locality ; and this communication or extension may take place in two modes,—either by conveyance of a portion of atmosphere in which is diffused its undefined specific cause, as in the hold of a foul vessel, from any place where it prevails epidemically ; or by the introduction of a sick body or any fomites imbued with its contagion.

6th. As a general rule, we may add that the contagiousness of yellow fever is limited by certain contingencies. This is Hosack's doctrine of contingent contagion ; but the same circumstances limit the efficiency also of the generating cause, as indeed of all the alleged causes of yellow fever. Thus, high temperature is necessary to its production, existence and extension. No matter *how* it is generated, the fact is known that it does not exist any where in winter. Hence it follows, that if carried into a cold region from a hot one, it will not diffuse itself. An exception to this rule is said to have occurred in Halifax, N. S., whither the disease was carried from the West-Indies, in May ; but the case is not satisfactorily made out.

A depraved atmosphere, no matter whether koino or idio-miasmatic, is pronounced to be essential to the spread of yellow fever. The exceptions to this statement, however, are numerous : Boston, New-Haven and Sullivan's Island, where there are no foul lanes or streets, on the one hand, in the latter, nor malaria in either ; and Germantown and Washington (near Natchez,) to which perhaps we may add Pensacola, Key West and Gibraltar. I do not doubt, you must remember, the probable influence of malaria in favoring the production and spread of yellow fever ; though I absolutely deny its sufficiency in itself to originate the disease. If we examine the map, we shall find every generating centre,

every permanent locality of this pestilence, to be situated in a malarious region ; and the same will hold good too of a large majority of its occasional seats. The first of these catalogues will contain the West-India Islands, several of the South American ports ; some of those upon the Gulf of Mexico, and perhaps a few upon the North American Atlantic coasts. The second will include Natchez and some of the towns on the banks of our great river, and Baltimore, Philadelphia and New-York ; and in Europe several seaports, both of the Atlantic and Mediterranean, and the large cities in their immediate neighborhood, Cadiz, Lisbon, Barcelona, Seville, Xeres de la Frontera.

Besides heat, the chief contingency which seems indispensable to the production and spread of yellow fever, seems to be density of population ; something analogous to "a city atmosphere." I know that both Coventry and McBride thought they had met with it in country places ; but they were led astray by the black vomit, which they regarded, falsely as I shall show, in the light of a diagnostic. They classed yellow fever as a malignant remittent ; they saw malignant remittent with black vomit, and called it yellow fever.

"Though the infection," says Lining "spread with great celerity through the town, yet if any from the country received it there, and sickened on their return home, it spread no further ; no, not even to one in the same house." Yellow fever is exclusively a disease of towns, of thronged and busy seaports ; circumscribed within the limits of dense cities and their immediate suburbs ; rarely if ever met with, even sporadically, in villages or farm houses. It is emphatically a local, never has been a general epidemic. Heat, moisture and malaria give rise to intermittents and remittents, and dysentery and jaundice, as readily on the borders of a solitary swamp or in a remote log house, as in the most crowded street—nay, doubtless much more readily. Yellow fever, it is true, has been generated in foul ships at sea, and in secluded military and naval stations ; but these present the essential contingency of relatively dense population ; and the exhalations or atmospheric vitiations produced by concentrating in small space considerable masses of men together. I do not profess to know the nature of these morbid changes in the air—the result of the conditions laid down. Their mode of

operation is also obscure ; though it seems essentially preparatory, it is difficult to say whether it acts simply as predisposing. The fact of their occurrence will not, I presume, be doubted or denied. They are analogous with those which are recorded as exhibiting themselves at various periods in the production of many forms of pestilence. Yet, however nearly these modes of atmospheric vitiation may seem to resemble each other, they preserve in every instance a specific and exclusive character ; favoring at one time the propagation of the sweating sickness ; at another of the black death ; of typhus at a third. They may occasionally coalesce or run together. Ferguson mentions that "the fever on board an infected vessel from Trinidad to Barbadoes, from crowding below decks at sea, ceased to be yellow fever, and became as truly typhoid as any he (I) ever saw ; but all that were taken ill after she came into harbor retained (regained,) the character of yellow fever in every respect, and showed not the least of the typhoid type. That the ship was impregnated with a typhoid contagion, capable of infecting others within its sphere," he adds, "I have not the least doubt."

I quote this brief paragraph from a vehement non-contagionist, to show you by his evident embarrassment and confusion, the difficulty of evading the force of such facts as he himself records. Even he cannot deny the existence here of a specific atmospheric vitiation, capable, not of changing, as he suggests, for this is obviously absurd, but of modifying the character of the cases of fever. It is, indeed, easy to understand how the disease which, under the open sky was highly inflammatory, would soon assume a typhoid character in the close and corrupt air of a ship's hold.

It behoves us to inquire whether these ærial changes to which we must ascribe the extension of epidemics, and which I think depend always, and of necessity, upon the presence of a *materies morbi*, however derived, are progressive or diffusive merely ; in other words, do the morbid exhalations simply mix themselves by dispersion, agitation, or positive exosmose throughout the air containing them ? Or, as many of our elders believed, are they capable of exciting in the animal exhalations, constantly thrown out into the atmosphere, any change analogous, as they were used to express it, to fermentation or putrefaction, by

means of which process the whole mass becomes morbid or corrupt.

A contagious disease originating in any one spot, spreads thence not only by conveyance, but by "infected atmosphere," widening its sphere of influence gradually on all sides, "as some small pebble stirs the peaceful lake"—until it takes in the whole limit of a dense or concentrated population, but losing its force as soon as it reaches an atmosphere free from concentrated animal effluvia. Hence, in the phrase of Lining, "no one having received the yellow fever in the city, and being taken on his return to the country, communicated it even to those in the same house."

It has been doubted, whether in the correct sense of the term, a predisposing cause can be said to exist in reference to a specific form of disease. The doubt is, however, without any other foundation than the notion formerly combatted, that all such maladies must necessarily arise from a single and exclusive source. In every climate and locality of which yellow fever is endemic, it is perfectly well known that strangers are more liable to it than natives and old residents. In the West India towns, and those on the Gulf of Mexico, and in South America, the immunity of natives is, I believe, complete. Here it is very nearly so, and yellow fever is familiarly called "the strangers' fever." Yet it occasionally, though very rarely, assails an adult native, if he has in any degree estranged himself by travel or prolonged absence. Length of residence gives protection relatively to the complete acclimation of the subjects—some of whom have been attacked after several years domiciliation among us. Our own children are also liable, in an undefined degree, between the ages of two and sixteen or eighteen; some individuals and some families remaining, as is affirmed, longer in this condition of immature acclimation than others.

This privilege or protection, belonging to the inhabitants of the endemic localities of yellow fever, does not exist in the places which it visits occasionally, and at distant intervals. The population of New-York, Philadelphia, or Boston, of Cadiz, Gibraltar, or Seville, are all equally liable to its attack when once it appears in the midst of them. These are remarkable facts, hitherto very imperfectly and unsatisfactorily accounted

for. There can be no question, that in the very great infrequency of second attacks affecting the same individual, yellow fever bears strong analogy to the known contagious diseases, small pox, measles, etc. If this immunity is not perfect, it is nearly so;—and, we may venture to affirm, that any person having been once assailed by yellow fever, will not have it again in any of its endemial seats, provided he remain there a consistent resident. There is much dispute whether a Gibraltar or New-York attack, will save a man from a second in Havana or Vera Cruz, or even in a subsequent epidemic visitation after a long interval. I believe the security in these latter cases less perfect, but I cannot help regarding it as still very notable, and fully proved.

The nature of the protection derived from acclimation is not known. The fact is not denied, and goes to confirm the doctrine so clearly established of the characteristic speciality of this disease, and its wide separation from intermittents and remittents, against which no acclimation defends. On the contrary, malaria fevers leave behind them a well known predisposition to succeeding attacks. Farther, a subject of previous remittent or intermittent, is more liable, if re-exposed to their causes after a short, than a long interval of health; in both these respects a marked contrast is presented between these types of fever.

I am doubtful whether the higher latitudes admit of what is called in hot countries acclimation. If upon the different degrees of cold and heat to which the body may be habitually subjected, are built up the peculiarities of national or climatic constitution, we surely have a right to suppose their influence to be opposite and contrasted.

The Southern man then retains from one summer to another, unchanged and more deeply impressed as his years increase, the habitudes consequent upon the application of heat and its collateral agencies, because his winters never bring sufficient intensity or protraction of cold, to alter or obliterate these habitudes; whereas, the Northerner undergoes a constant alternation of condition of body, as being subjected to the annual impressions of two opposite climates, his summer being as hot, though shorter than ours, and his winter longer and very much colder.

I have said that long residence, and a previous attack of yel-

low fever, secure the constitution for the future. Preceding attacks of other diseases also endemic, and as has been contended, of similar nature—such as bilious remittent, malarious dysentery, etc., are much dwelt on as conferring similar immunity. I place no confidence in these views. I have seen foreigners recover in spring from typhus fever here, to die in autumn of yellow fever. I have seen three deaths from this pestilence of persons who had gone previously through a “rough seasoning” from our ordinary malaria remittent; both attacks, though at an interval of three and five years, having occurred in yellow fever summers. While treating of this topic of predisposition, it deserves to be noted that negroes are less liable to yellow fever than the white race. R. Jackson affirms that no negro immediately from the coast of Africa, has ever been attacked with it in Jamaica.

Lining, writing at a time when there were very few negroes here except Africans, tells us he “never saw or heard of an instance among them.” On the other hand, Rush says that blacks were affected by it in Philadelphia in 1793, in common with the whites, but that “it was lighter in them than in the whites, although many of them died with it.” Musgrave declares that in Antigua, in 1816, it extended promiscuously over both blacks and whites; and Perlee gives the same statement of its prevalence in Natchez, Miss., in 1819. Here I have never seen an African negro attacked with it. I have met with several well marked cases among our “country-born” blacks, though they appear to me much less liable to take it, and as Rush says, they have it more lightly. In both these respects, as you would suppose, mulattoes occupy an intermediate position.

The predisposition of the various tribes and races of white men, differs relatively to their national and individual temperament. The Englishman, Irishman, Scotchman, German, New-Englander and Western man stand in the order of liability as I have arranged them. Far beneath them are the Frenchman and the Spaniard. In proportional mortality they may be differently ranked—the Irishman and the German are far above the rest; the Frenchman and Spaniard again stand lowest on the catalogue.

The exciting causes of yellow fever offer nothing peculiar in

the enumeration, but include all those circumstances adapted to the production of fever of other types. Exposure to the heat of the sun by day, to the dampness of our chill dews by night; fatigue; excesses of all kinds, but above every thing else, intemperance in drinking.

A foreigner who, coming to reside among us, desires to avoid so rough and dangerous a seasoning as this cruel disease will afford him, or at any rate to diminish as far as possible its violence, will select his lodgings in an open and dry district of the town; sleeping in a chamber well ventilated, and elevated two or three stories from the ground. He must remain under shelter and at rest during the heat of the day, and shun all exposures to night dews or rain. He must be strictly and uniformly temperate in all things. Low diet, bleeding and purgatives, are injurious rather than salutary, as tending to reduce the system below the point of healthy action, and diminishing the elastic capacity for resistance to noxious agencies. A mercurial course, formerly fashionable as a prophylactic, is now seldom thought of. It is entirely useless, and worse.

The views of the nature of the disease and its causes which I have adopted, lead me to regard the spot where it originates as an "infected district," to employ a phrase now familiar in the cities of the United States. From this infected district, readily designated by the quick succession of cases within a limited space, I would at once expel by the vigorous exercise of municipal authority, all strangers, and families including young children; affording them, if necessary, proper lodgings elsewhere at the public expense. Besides preventing the sacrifice of lives whose value might not be calculated, and the injury which must result to the commercial character and activity of the city from the spread of the disease, in addition I say, to all this, I am persuaded it would cost less to protect the subjects of the pestilence by such forcible ejection and removal, than afterwards to afford them when attacked, the means of cure and the necessities and comforts of sickness and convalescence, or the rites of burial.

The Symptoms with which this malignant disease makes its invasion are somewhat irregular, varying in the different cases with the circumstances of constitution, season and locality. It might be useful but would not be easy to distinguish them, as

has been attempted, into the peculiar or characteristic, and the common, or such as occur in other autumnal fevers. These latter, indeed, predominate so entirely at the beginning of the attack, that any physician, however great his intelligence and experience, may be deceived if he fix his attention exclusively upon them. We must duly consider the endemic or epidemic constitution of the place and of the time, and the predispositions of the subject in reference thereto, according to the advice of the sagacious Sydenham; being directed in the formation of our opinion by all the facts.

The paroxysm of yellow fever often commences with a degree of chilliness, though there is not, for the most part, a formed rigor. To this, soon succeed heat and dryness of skin, with uneasiness at stomach and pains in the head, back and limbs. The patient is anxious, alarmed and restless; his face is flushed; his eye muddy, red, and suffused as though he were about to shed tears—a state of the organ well described by Robert Jackson as closely resembling that produced by exposure to the smoke of green wood. It shuns the light, and its motions are painful. The head-ache is often intensely violent, affecting the forehead chiefly, and persisting throughout the attack; in some cases there is confusion of thought or delirium, or even furious mania from the first. The spinal aching is sometimes intolerable. The pains in the limbs are usually severe, and are seated both in the joints and in the muscular parts,—the calf of the leg especially. The stomach, which truly seems to be, in the language of Rush, “the throne of the disease,” is almost uniformly distressed and irritated, and vomiting comes on spontaneously, or is easily excited by anything taken. Its contents are thrown up, then bile perhaps, and afterwards large quantities of a thin mucous fluid variously coloured. While retching, the patient suffers much from soreness and pain; he shrinks from pressure applied to the epigastrium, and complains of a burning heat at that point, combined with a feeling of weight and hardness. The respiration is sometimes hurried, embarrassed and irregular; at others, slow and labored, with deep and heavy sighs, and great oppression about the præcordia.

The skin is generally dry and harsh and hot, causing in the fingers applied to it, a pungent sensation, peculiar at least in

degree. The yellow hue, so familiarly referred to, first tinges the eye, then the forehead, neck, breast, arms, and body. Sometimes it is not noticeable until the very last stage, and occasionally does not show itself at all. It differs very obviously, I think, from the sallowness of protracted remittents and of jaundice, being darker and deeper, between an orange and a bronze colour.

The pulse is less to be trusted here than in ordinary fevers, and, indeed, in a notable proportion of instances, exhibits little or no correspondence with the state of the general system. In the more common cases, it is frequent, hard, voluminous, tense, bounding, quick or jerking, and irregular.

The tongue is at first soft, swollen so as to show the indentations of the teeth, and becomes soon very red at the point and edges. The thirst is usually described as excessive and unceasingly urgent. Ice and cool drinks are, indeed, desired vehemently by the patient, as much, I think, on account of the relief they afford to the heat of the burning stomach as for thirst, a distinction noted by Lining long ago, who says, "very few complained of thirst, though they had a great desire for cold liquids."

The bowels are torpid, responding slowly to the most active cathartics; stools, when procured, are often, from the first, dark colored and acrid. I saw one case commence with diarrhœa.

The countenance is, in all malignant disorders, marked and striking in its expression. In yellow fever, it has been thought sufficiently peculiar, to denote unequivocally and at first glance the character of the attack. The aspect is distressed, gloomy and impatient; the face flushed and turgid; the eye red and watery; there is withal a singular wildness and fierceness of the visage, resembling somewhat that of intoxication, combined with sadness and terror.

These symptoms constitute what has been called the first stage of the disease, following the division recognized so commonly by writers, into three stadia or periods. Its duration varies much in the several cases, and is determined by circumstances not easily pointed out. In this stage is comprised the whole of the febrile excitement which essentially belongs to the attack. I have seen it pass over in four hours, and last between

sixty and seventy, the average being probably not far from thirty-six to forty-eight.

The second stage commences with an abatement of many of the preceding symptoms, and has hence been improperly considered a state of remission. If the word is meant simply, as in other instances, to refer to a diminution of febrile excitement, it is very ill-applied to an apyrexia confessedly total—a complete intermission—"a stadium," says Lining, "without any fever."

The head-ache is now relieved; the pains in the back and limbs subside or disappear; the skin is more pliable, cooler, and moister; the pulse is nearly natural, perhaps a little more frequent and softer than in health; the breathing is easier; the pain and burning of the stomach lessened; its irritability not so urgent, and the act of vomiting attended with less effort; the face is less flushed, the eye less red and suffused, and on the adnata a yellow tinge is gradually substituted. The well known orange hue overspreads the surface; it is erroneously confounded with jaundice by many writers. I regard it rather as owing to a depraved condition of the blood itself, and to a weak and morbid state of the capillary circulation. It has been seen pervading the cellular substance throughout and in the peritoneum; but this I have not met with.

The patient, at this juncture, seems to be freed in some measure from his oppressive anxiety and dejection, and is once more revisited by the heart-cheering influences of hope. But hope here, as in all other human affairs, proves herself too often a deceiver, and a short time serves to dispel her illusions. The stadium thus characterized, lasts but for a few hours—never longer, I think, than from twenty-four to thirty-six, perhaps usually about twelve to eighteen; when the disease, if not subdued or controlled, developes a violence and rapidity of progress infinitely disproportioned to the enfeebled powers of resistance in the constitution.

Of this third and last stage, the prominent feature is the collapse, as it has been called—the extreme prostration of the subject. His pulse sinks, is quick, unequal, depressed. The skin grows dark and assumes a mahogany or bronze hue, especially on the face and hands; the discoloration of which may be removed by pressure and a paleness substituted, disappearing

slowly when the finger is taken off. The tongue sometimes continues whitish, soft, swollen, and moist on the sides, with a dark brown, dry streak in the centre; it often becomes dryish and of a fiery red, and smooth, with fissures perhaps oozing an offensive blood. Of the same hue and appearance is the whole lining membrane of the mouth. The stomach is now so irritable that it retains nothing, and the vomiting, hitherto attended by some retching and straining, is very easy as well as frequent. The mucus and fluids thrown up, are found to contain flakes of a dark color, the proportion of which increases, until they come to resemble a mixture of soot or coffee grounds in water. This is the black vomit, a justly dreaded and terrible symptom. The amount ejected is often astonishing. It escapes sometimes in the action of hiccupping, and occasionally spouts forth from the mouth with some force involuntarily, as the patient lies on his back. The contractile power of the stomach, on the other hand, ceases entirely in some cases to act, and there is no vomiting; the belly is distended, and a loud gurgling is produced by every movement of the body. The bowels, so reluctant at first, may now yield; the alvine discharges becoming frequent and abundant, consisting often of a fluid identical with the black vomit. The powers of life rapidly decline; breathing is laborious, with deep sighing and moaning, and intolerable oppression and distress about the præcordia and the epigastric region. The skin is cold and clammy; the eyes dim and hollow; the tongue black and tremulous; there is low muttering delirium. Hemorrhage ensues in a considerable proportion of cases, the blood exuding from the gums, tongue, fauces, nostrils, stomach, intestines, urethra, eyes and ears; and death finally relieves the miserable patient from sufferings dreadful to contemplate.

Such as I have above described, are the usual phenomena of yellow fever. In the great majority of instances, it puts on among us the features of open inflammatory excitement; yet the deviations from this regular history and progress are by no means unfrequent, and offer to us pictures of strange and almost unaccountable diversity.

Like other fevers, it often assumes a congestive disposition, the tokens of openly developed vascular action being absent or notably deficient, and the system appearing to sink prostrate at

once before the extreme force of the morbid causative agency. The organs are variously affected in cases of this kind. The head being the centre of determination, lethargy, stupor or coma may supervene, or death ensue in a few hours, preceded by frightful convulsions. The lungs are occasionally attacked with great oppression and dyspnœa. The stomach being assailed, the symptoms are exceedingly similar to, or indeed identical with those which follow the administration of the more intense poisons, such as arsenic; all regularity of febrile progress being lost in the overwhelming derangement of this most important organ and its extensive sympathies.

Early and irretrievable collapse, with abundant black vomit, are the usual attendants. These cases are almost uniformly marked by a peculiar bronzed or dark mahogany discoloration of the skin, ascribed to the sluggish or suspended action of the extreme vessels of the capillary system, visible on the surface, inferrable as present everywhere. It is one of the worst symptoms, and is attended by many circumstances all portending great danger. The patient usually utters little complaint, though the countenance, which is often listless, unmeaning and apathetic, occasionally assumes an indescribable expression of anguish and horror. All the susceptibilities seem blunted; the stomach is not tender on pressure or obscurely so; the bowels are insensible to purgatives or enemata; the skin becomes pale under pressure applied, slowly resuming its dark hue; sinapisms or blisters laid upon it are unnoticed, and if they produce inflammation, the parts are apt to become black and sphacelate. I have seen this occur as long as five days before death, though such malignant attacks generally terminate on the third, fourth or fifth day.

It would be vain, if not useless, to attempt a detail of the many varied forms assumed by this pestilence at different times and in different localities. They are rather to be regarded as interesting pathological curiosities, than as forming definite classes. Among them we may note what Rush used to call the "walk about cases," in which the patients scarcely feel or acknowledge they are ill; refuse to lie down, and are unwilling to be prescribed for; but, with hardly an exception, sink and die promptly. A stout, fresh New-Englander, engineer of one of our

steamboats, thus retained, to the moment of his death, his uncommon muscular strength, and perhaps still more strangely, his florid, ruddy countenance. It was singular, indeed, to see him going about from room to room and into the piazza, when, from the urgent irritability of his stomach, he was obliged to carry with him always a vessel to receive the black vomit, which he threw up frequently and in large quantities.

A Scotchman came into the marine hospital, complaining of nothing but head-ache, ("a sair heed,") and making it his especial request that he should not be placed in the ward with patients ill of fever, of which he expressed the greatest dread. He was incessantly restless and uneasy, and had a visage of peculiar horror and anxiety; yet his tongue was clean, his stomach quiet and his pulse and strength quite natural until the fifth day, when prostration suddenly occurred, black vomit came on, and he died with hemorrhage bursting from every outlet of the body.

The duration of yellow fever differs relatively to the form it puts on. Congestive attacks terminate early, say on the third and fifth days. The ordinary inflammatory cases die on the fifth, sixth, and so on to the ninth. In extreme instances, death may take place in a few hours, on the one hand, and, on the other, a typhoid condition may be protracted, as I have known, to the nineteenth, twenty-first and twenty-fifth day. Recoveries are in general slow; the tedious and lingering convalescence is apt to be harrassed by the formation of abscesses on the body and limbs, which suppurate unkindly.

Relapses are rare, or rather unknown; indeed, few affirm their occurrence. Of second attacks, I have already spoken, and am prepared to maintain, that although some well attested instances are recorded, yet the immunity is very nearly complete; and that this may be fairly alleged as one of the characteristics of the disease under discussion.

Prognosis. Yellow fever must be viewed as one of the most destructive forms of pestilence, exceeding even the plague, perhaps, in proportional mortality. In 1804, in Gibraltar, out of a population of nine thousand civilians, but twenty-eight persons escaped an attack, and the deaths amounted to more than one in three. Musgrave gives a scarcely less terrible account of it in Antigua in 1816. In Jamaica, under the care of Dr. Hume,

three out of four died of it. In the city of Philadelphia, in 1820, there died eighty-three out of one hundred and twenty-five—about two out of three. In the same year, according to official returns, the loss in Spain, at Xeres de la Frontera, was 70 per cent.—nearly three out of four.

Sir James Fellows tells us, that “during the fever of Cadiz in 1800, the air became so vitiated that its noxious qualities affected even animals; canary-birds died with blood issuing from their bills, and in all the neighboring towns which had been infested, no sparrow ever appeared.” Rush says, that cats died in great numbers in the streets of Philadelphia from the pestilential state of the atmosphere. Perlee affirms, that about Natchez, in 1819, “not only domestic animals, but even the wild deer of the forests shared the influence of the epidemic constitution of the air.”

In our own city, thank Heaven, the disease has never displayed a malignity so frightful. The proportional mortality in different seasons differs very much; in 1817 and 1824 it was very great; and much less in 1819 and 1827. Considered extensively, it will not average more, I think, than 1 in 5 or 6.

The individual prognosis is much modified by circumstances. The attack is apt to be violent, and its progress hasty, in the sanguineous and plethoric. For the intemperate there is almost no hope. National habits and modes of life have a decided influence. The Irish, Germans and Scotch afford us the worst cases; Spaniards, Italians and Frenchmen are very apt to recover. Midway stands the Englishman, the Northerner and the Mountaineer, or inhabitant of our interior country. Generally speaking, the more recently a stranger has come here, the more severe his attack. Among the young children assailed, the ravages of this pestilence are very great. Rush notices the large mortality among them in Philadelphia in 1793; and the mothers of Charleston long remembered with tears the unhappy summer of 1817.

In ordinary inflammatory cases, the condition of the stomach is of paramount importance; every thing depends upon its powers of retention and its tranquility. Constant nausea and retching, especially if attended with burning at the epigastrium, and notable tenderness on pressure, give a gloomy prospect. The pulse

is not generally to be much depended on ; it denotes danger if it become small, quick and irregular. A skin moist and relaxed is unfavorable ; so says Rush, and truly. This symptom was observed here more frequently in 1838 than on any other occasion. In bad cases, the febrile paroxysm, the first stadium, is usually short ; yet I saw a patient recover in whom it lasted no more than four hours. After the subsidence of this original paroxysm, you will be pleased with the supervention of any degree or form of febrile excitement. This indeed has been properly spoken of by Robert Jackson, as "a new stream of life." At this crisis, there is every reason, even in attacks of ordinary severity, to dread a sudden collapse or a gradual sinking of the strength ; and it is at this point of time and under these circumstances of exhaustion, that the black vomit makes its appearance. An unnatural calm and stagnation are substituted for the unquiet agitation which has shaken the patient ; from which it is difficult to rouse him by any therapeutical measures. Any irritation which shall excite him ; any determination to whatever organ, which shall stir up the vital powers now threatening to succumb, will at least protract his fate and lengthen out his chances of recovery. Hence, even a typhoid heat of skin and stupor and muttering delirium, are better than a tranquil indifference. Nay, I have seen a quasi phrenitis develope itself more than once, and with favorable results. The stomach is the most vulnerable point, and a division of the force of the assault is apt to be attended with consequences less promptly fatal than its concentration. Hence also, strangury produced by epispastics, or the internal exhibition of cantharides, is generally recognized as a good symptom. I have however lost one patient, in whom it had been brought on.

You must not confound this with the spontaneous suppression of urine, sometimes met with ; the defect of renal secretion. This is almost uniformly a fatal sign here, as in cholera. It has happened to me to see two recoveries from it, nevertheless ; and in one strange case it lasted five days, and then the secretion was resumed ; but after many reverses and a long protracted illness, the patient died. In such suppression, there is no pain nor distention of the bladder, and the catheter carefully introduced brings away no fluid from it. So far as I have observed, the

appearances on the skin known as petechiæ, vibices, etc., are forerunners of death. There are recoveries, however, recorded after them. I would say the same of the dissolved condition of the blood—gory, diffuent. Yet Rush affirms that they were removed by venæsection, when it had been indicated by the continued tension of the pulse!—a contingency which I should not have hesitated to pronounce incompatible and impossible; and that sisy blood had succeeded to that which was dissolved!

As regards the *black vomit*, your prognosis is always most unfavorable whenever it occurs in yellow fever, whatever may be the condition of your patient in other respects. I do not affirm it, as some have done, a mortal sign; for I have seen several exceptions to the rule; ten in my own practice; but it is a rule, notwithstanding, and you will do well to be warned accordingly. Concerning the nature of this phenomenon, so much has been said and written, that it deserves a moment's attention from us. The black vomit consists of dark flakes, specks, or small masses diffused more or less thickly, in a lighter colored fluid. I have seen the same matter passed downwards in a pasty state, forming a figured or semi-figured stool. Though occurring so familiarly in yellow fever, as to give it a name in one language at least, it is by no means exclusively or specifically a symptom in that disease only, and of course cannot be regarded as a diagnostic. I have myself met with it in several cases of bilious remittent and in gastritis and enteritis; in one case of varioloid, occurring in winter; in catarrhal fever once, in March; twice in dropsy, and once in the familiar vomiting of pregnancy. It attends puerperal fever occasionally, and always, I believe, follows rupture of the uterus. Dr. P. G. Prioleau, whose professional experience has seldom been equalled, and whose authority upon any point of fact is indisputable, assured me that he had repeatedly known it take place among the easy vomitings of pregnant women, without unpleasant results; and that he once witnessed its spontaneous occurrence in a youth from mere fatigue, ceasing readily, and leaving him quite well. I have said that in yellow fever it usually occurs about the commencement of the second stage, and that it is generally followed by more or less prostration or collapse. The earliest dates that I have recorded of it are the sixteenth, twentieth and thirtieth hour. In

these instances, it was totally unexpected ; having been preceded by no symptom of danger, no circumstance that arrested any special attention. The nature of the fluid has been matter of some dispute. It was first thought to be composed of portions of the villous coat of the stomach, dark and gangrenous, thrown off, and macerated in and mingled with the dissolved and corrupted contents of that cavity. But as no one could recover after gastric sphacelus, and as this condition was not found in post mortem examinations, the notion was necessarily abandoned.

It was alleged by some to consist of vitiated bile—black bile ; but Physick and Cathrall traced it into the vessels of the mucous tissue of the stomach. It is found in the stomach, when the pylorus is closely contracted. It is found abundantly both in the stomach and bowels, while ordinary bile fills the gall bladder. It is flaky or granulated, and brownish black ; the darkest colored bile is tinged with a yellowish or greenish hue, and is smooth, glossy and homogeneous.

The majority at the present day regard it as a form of gastric hemorrhage. Warren, of Barbadoes, calls it “mortified blood.” Bancroft says it is “merely effused blood altered in appearance and darkened in color by the gastric juice, or by some chemical decomposition.” But this view is not altogether free from difficulties. The change of appearance is not accounted for, as we know it takes place in the vessels. We never meet with it in acknowledged hematemesis, the blood being always recognizable in that hemorrhage by its proper qualities. Dr. Rhees, of Philadelphia, informs us that on instituting a series of observations with the solar microscope upon black vomit, he found it to contain innumerable animalculæ. A single drop exhibited many thousands, being indeed a mere congeries of them. When recent fluid was examined, they were alive and in constant motion ; if suffered to stand awhile, and when taken from the dead subject, they were still and torpid. Comparative examinations were made of the discharges from the stomachs of patients ill with bilious remittent and other autumnal fevers, but no similar appearances were detected.

Autopsy. The brain is usually found more or less affected ; the vessels are injected, the membranes seem inflamed, and serum, according to McArthur and Ffirth, occasionally effused

into the ventricles. The latter, as also Robert Jackson, met with "some cases in which rupture of vessel and effusion of blood had taken place." The lungs and pleura have been found in some degree inflamed. The liver does not present any constant appearances. In some it is soft, pale and flabby, in others engorged with dark blood. I have frequently found it in a natural state, as far as could be judged by the eye, and so say Ffirth and Jackson. The gall bladder is usually healthy and moderately distended with bile of a thick ropy consistence, and of a dark greenish or brownish hue. It has been seen slightly reddish as if tinged with blood, and containing a granular sediment. The urinary bladder is found sometimes inflamed and contracted; blood is occasionally poured into it, as indeed into every cavity of the body. But in the stomach we find the most uniform traces of disease. It is always inflamed, often in a very high degree; in this condition the smaller intestines usually partake, the duodenum especially. Hence some have styled the malady a gastro-duodenite. Ffirth found the large intestines also in a state of inflammation, but this is not ordinarily or strikingly the fact. Pym, Peyre, and others, speak of sphacelus of the stomach. This, if it ever happens, must be rare. I have never met with it, and my opportunities for examination have been numerous. None of our American physicians report any thing of this kind. Perhaps we may find in the following paragraph an explanation of such statements. "I have seen," says Dr. Physick, "the inside of the inflamed stomach as black as the black vomit, resembling it in color exactly. This color differs very much from the dark purple of a part in a state of gangrene, and I have never observed any putridity attending it." Erosions of the mucous coat are described by R. Jackson, Ffirth, and others. In one instance, and but one under my notice, some partial erosion with softening of this tissue occurred.

In the Treatment of yellow fever of the ordinary inflammatory form, our first and principal indication is obviously the reduction of vascular excitement. We must aim at the accomplishment of this purpose by the most prompt and efficient means, compatible with the ultimate well being of the patient. A few hours at the very commencement of the attack comprises all the time allowed us for the hopeful application of our remedies, as

we have to contend with scarcely any disease in which the vital powers are so soon crushed and overwhelmed beyond the capacity for resistance. The force of morbid determination too, is chiefly directed upon an organ at once of the utmost importance and of the greatest delicacy—the stomach, whose sympathies involve peculiarly the tone and energy of the whole system.

For the fulfilment of this indication, our profession has with very wide consent resorted to the lancet, and the authorities who commend it to us are of the highest repute. Robert Jackson began the treatment of his cases “by bleeding in such quantities as was judged proper.” Rush carried it to a prodigious extent, abstracting from many subjects—one hundred to one hundred and fifty, and even two hundred ounces of blood; and writes of it in such terms that we must suppose it to have been with him an absolute *sine qua non*, and unattended with any of the slightest objection or ill consequence. Musgrave tells us that he has “repeatedly taken upwards of forty ounces at one bleeding, with success; and with equal success, in several cases renewed the bleeding up to the third and fourth time.” Nevertheless, I am compelled to differ from these respectable authorities. I regard venæsection as by no means an essential, nay, nor even a general remedy in yellow fever. Since I have been attached to the medical profession, now more than a quarter of a century, the disease has become several times epidemic and generally prevalent in our city; a certain degree of familiarity with it, will then hardly be denied me. In 1817, one of my medical friends engaged in the dispensary practice, depended chiefly upon the lancet; while the gentleman who had the care of the Marine Hospital, which was filled with patients, and in which I spent many hours of every day, scarcely if ever resorted to this means of depletion. Comparing the results of these contrasted courses, I could not help inferring that the statements contained in the books concerning the necessity and efficiency of bloodletting, if not altogether unfounded, were, to say the least, prodigiously exaggerated.

With the physician last alluded to, (Dr. C. H. Glover, now of Walterboro’,) I was associated in 1819, in the care both of the Marine and the Yellow Fever Hospital, in which institutions the number of patients collected was very large, and with him

made careful trial of all the modes of practice then known and applied to the cases. Our conclusions then, confirmed since on my part, by long continued and somewhat extensive observation, were unfavorable to the general employment of the lancet. Taking the accounts given us by the advocates for it, already mentioned, I have been at least equally successful in the management of the disease. Since 1819, I have had occasion to bleed but four patients, two of whom died. In these, the extreme violence of local determination, and intensity of suffering at the very onset, induced me to resort to it as a means of relief; yet in none of them was the influence of the remedy at all gratifying. Among the great numbers whom I have seen bled by my medical friends, I have noted but a single case in which it exhibited any very striking efficacy; in this one, however, it appeared at once to subdue and control the attack.

I repeat then, that while I propose to you no speculative objections against the lancet, and admit that circumstances may call for its occasional employment, the results of experience and observation, (the true bases of all therapeutical knowledge,) are unfavorable to the general or frequent resort to it. Nor is authority wanting in opposition to the weighty names which I have already cited in its favor. "Experience," says Gregory, "giving the result of his extensive reading on this disputed point: "Experience has proved that though occasionally, it is not generally beneficial." Perlee declares that "the necessity for venæsection did not exist. In some plethoric subjects it was tried, without any good effects however." Dr. Pinckard, in his history of his own case, mentions his having lost twelve or fourteen ounces of blood at the commencement, and its being followed by extreme debility—"a degree of feebleness most deplorable, and such as it appeared impossible to recover from." Good, like Gregory, impartially collating the testimony adduced, warns us of the dangers attendant upon "the double debility induced by the disease and its remedy, however judiciously it may be had recourse to." From all this you will not fail to perceive at least the necessity of due caution and prudence in the use of the lancet. It is available only in the first stage of the disease, which rarely affords opportunity for its repetition. If you determine to resort to it, place your patient half erect, make a large orifice and draw

from the vein at once a sufficient amount to make a forcible impression on the system. You will thus fulfil your purpose in the reduction of vascular excitement, with the least absolute diminution of the original powers of action and resistance in the constitution.

For my own part, I prefer to substitute the cold bath, which, if I do not deceive myself, is equally effectual in subduing morbid excitement and controlling irritation, without any positive expenditure of, or subtraction from the vital forces. Relief from the pungent heat of skin, the tormenting thirst, the distressing headache, the pain and irritability of stomach, you will never fail to procure. This relief, it is true, will be partial and transient, but the remedy may be repeated as often as seems requisite, without danger or injury. The termination of the chill, if there be one, when the face becomes flushed and the surface dry and hot, a condition almost characteristic in the degree attending this form of fever, is the moment for affusion. Seat your patient in a convenient vessel, and pour rapidly from some slight elevation upon his head and shoulders and over his naked body, a full large stream of cold water, continuing it until his face becomes pale or his pulse sinks. In general the sick man himself will exult in the delightful ease which follows it, and will solicit its frequent repetition. I have never yet seen any unpleasant consequences from it. Even children and timid women reconcile themselves readily to the shock of the affusion, and regard it as pleasurable rather than otherwise. The surface should be rubbed dry, and the patient on lying down, covered so as to be comfortably warm. A mild glow precedes a free cutaneous transudation, often accompanied by a soft slumber. The return of the pungent cutaneous heat and restless tossing demands the repetition of the bath. Immersion is sometimes preferred; and occasionally we choose to sponge the body, to avoid motion or disturbance. Some wrap the subject in a wet sheet. The contra-indications to the use of the bath are, the great age or debility of the patient, and the rather unfrequent determination to the lungs and bowels shown by dyspnœa and diarrhœa. Nor would I repeat it, if it had induced protracted chilliness or other discomfort.

The emetic—so often prescribed by some practitioners, seems

to me obviously forbidden by the pathological condition of the stomach, already irritated—with the vessels on its mucous surface deeply injected with blood, and a strong proclivity to both inflammation and hemorrhage. If the patient is attacked however, soon after a full meal of which he cannot disgorge himself, I would administer a proper dose of ipecac or sulph: zinci, as the least evil under the circumstances. Every effort should then be made to restore the quiet of the disturbed organ by cups, or leeches perhaps; always by fomentations and sinapisms, and after a time, by the application of epispastics.

The exhibition of purgatives forms an indispensable part of the treatment, and must be attended to without delay. The bowels are for the most part torpid, and bulky or nauseating formulæ will be instantly rejected. Calomel is, on these accounts, almost universally to be preferred, but it is slow in its effect and requires to be aided and urged forward. This is best effected by the solution of sulph: magnesiae. They may be administered alternately, at intervals of two hours, until they act sufficiently. “There is,” says Chapman, “a species of medical harmony observable between certain morbid states of the body and their appropriate medicines,” a remark whose truth is exemplified in the present instance. The above articles are singularly well fitted for our purpose here; they are better retained than any other, excite the least disgust or unpleasant sensation, and procure abundant secretion and excretion from the alimentary canal gently and promptly. When this is effected, we may lay aside the neutral salt and combine some diaphoretic with our mercurial. When the stomach will bear the pulvis antimonialis of the shops, it is well adapted. After having formed a predilection for this combination, I was pleased to find it highly commended by O’Halloran, who accompanied Robert Jackson in his visit to Andalusia, in 1820.

When the antimonial nauseates, some other sudorific must be proposed. The alkaline and diaphoretic mixture will often succeed well. The infusion of serpentaria, with or without the nitrate of potass, is often used. None of these formulæ are worth the risk, however, of irritating the stomach, and if they do this, all should be abandoned. My own reliance, in the majority of cases, is placed absolutely upon the mercurial treatment.

The free doses of calomel first given as cathartic, must be persisted in until the patient has become definitely better, or ptyalism is brought on. It is a matter of great importance that this shall be accomplished speedily, in order to arrest the destructive and rapid progress of this terribly malignant disease. Many and various are the measures proposed, with a view to hasten the excitement of the mercurial action in the system. Some rely on opium, as checking its purgative effect; some regard alkalies as specifically adjuvant. I am convinced that we shall succeed best by a judicious attention to the general symptoms. By the cold bath and the cathartic, affusions upon the vertex, and cups or mustard poultices upon the epigastrium, we relieve morbid local determination, and diminish diffused excitement; relaxing cutaneous constriction, deriving to the extensive surface of the intestines, whose vessels, congested and engorged, are unloaded by soliciting free mucous discharges.

Let me remind you once more, that in employing the word ptyalism, I do not intend or imagine the mere affection of the salivary glands, or the increased secretion of their fluid, to be in itself of any special importance towards the cure hoped for. It is thus only, that we are able to ascertain or point out that state, of which ptyalism is the sign or token; when the subject is said to be "mercurialized," and the various organs and tissues imbued with and under the dominion of our excellent remedy. How universal this is in extent, prevailing over the whole capillary system of vessels, or at any rate that division of them which is engaged in secretion, is easily shown. As soon as the flow of saliva is thus increased, the dry tongue becomes moist and soft; the harsh, hot skin is relaxed and covered with perspiration; the stools begin to be mixed with bile; slight fever, if absent before, is again lighted up; and some emaciation is soon perceived. Let us add the so much talked of ulceration of the gums, and cheeks, and tongue, and we have a fair picture of the morbid condition which it is proposed to substitute for that which constitutes yellow fever.

As to the actual efficiency of this course, I am prepared to speak with confidence. In the whole of the practice in yellow fever which I have seen, I have not noted, nor do I recollect a single case, in which ptyalism was induced during the continu-

ance of the first stadium or febrile paroxysm, which terminated fatally. Nor are examples wanting of an abrupt check being given by this means, to the progress of the disease, after it had advanced into the second stage—new life being thus aroused in the prostrate constitution. To prove these statements, I could recount to you, were it fitting in this place, indefinitely numerous instances, as well from my own note books, as from the published records.

Rush did not confine himself to his favorite remedy—venæ-section, but depended equally upon his well known doses of “X and X”—“calomel and jalap.” He mentions their “affecting the mouth,” and tells us that “he lost only one patient in whom this occurred.” “Salivation,” he says, “was a trifling evil compared with the benefit derived from it.” Clark, treating of the good effect of mercury in dysentery, declares himself “thoroughly persuaded that it is possessed of powers to remove inflammation and ulceration of the intestines.” We know the stomach and duodenum here to be always inflamed. Annesly contends that it is a direct sedative to the inflamed mucous digestive membrane. Beaumont always found it render this surface pale, when morbidly reddened in St. Martin. Dr. Wade tells us, that in 1791, in Bengal, he “did not lose a single patient in whom the mercury affected the salivary glands.” Dr. Chisolm, of Grenada, affirms unhesitatingly, “when ptyalism comes on, all the alarming symptoms disappear.” “Long experience has convinced me that the safety of the patient depends on the excitement of a new action.” “In forming a favorable prognosis, I was chiefly, perhaps always directed by the supervention of mercurial action on the gums and salivary glands. Many instances have occurred to me which have taught me not to despair while the most distant hopes remained of accomplishing that.” Dr. Robert Jackson, who saw it in almost every region invaded by it, and in almost every form which it assumes, holds the same language. O’Halloran describes the success of this treatment in Spain. Dr. James Johnson, in reviewing their report, confirms its truth, and trusts as they do, mainly to the mercurial. Wilson, the latest West Indian writer, confides in the same practice. I will only add to this “cloud of witnesses” the names of Potter, of Balti-

more, and Perlee, of Natchez, who pronounce themselves strongly in favor of the views thus laid down.

But while thus stating to you my decided preference of the mercurial treatment of yellow fever, I must not omit to lay before you fairly, the objections alleged against it.

"In the milder cases," argues Good, giving expression to the opinion of many on the subject: "In the milder cases it is not wanted, and in the more urgent there is no time for its use." But this reasoning proves too much if it prove any thing, for it is certain that a spontaneous cure does often occur in the milder attacks of whatever pestilence, as even in the great plague of London; and of the most curable disorders, there is a certain proportion that will die under the best medical treatment; and thus we may conclude against any remedy in any disease. But he omits to notice a third or medium class of cases, neither too mild to stand in need of judicious management, nor too rapid to admit of its application. I scarcely need remind you that it is to this medium class, by far the largest of the three, generally, that we address our prescriptions; it is among these that we make our observations and draw our therapeutical inferences. We can easily account for the prevalence of the notion that the action of mercury is too slow, too long in being excited, to be trusted to in the management of a disease so rapidly destructive. One of the opponents of this mode of treatment, while discussing its merits, fortunately gives us the details of a case in which, he says, "it was pushed with vigor to a great extent. Five grains were administered every three hours, mercurial frictions employed, and the blisters dressed with the ointment. The patient died on the fifth day, not the slightest tenderness of the gums having been produced."

In another instance he tells us "its efficacy was fairly tested! Extensive frictions with the ointment were employed, and calomel administered in small and repeated doses. On the fourth day the gums became sore and a slight ptyalism was induced, which, however, soon subsided before the increasing force of the disease. Black vomit occurred on the fifth, and death followed."*

* Vide report on the yellow fever of Philadelphia, 1820, published in the Philadelphia Medical Journal.

It is thus that mercurials have lost their reputation as curative of fever ; by falling into the hands of physicians who prescribe them in insufficient quantity, and so observe a cautious neutrality between the patient and his malady. What would we say of "small and repeated doses" of opium in spasmodic colic ? or of "small and repeated bleedings" "in vehement pleurisy or hepatitis ? The principle is exactly the same. But the stroke which would crush a pigmy will not even shake a giant. Mercury has been happily denominated "the Sampson of the materia medica ;" and in the contest with this mighty foe, he must put forth all his strength and exert all his energies. "When the symptoms of a formidable fever appear," says Chisolm, "and the danger is evidently imminent, the dose of calomel should be increased even to twenty or thirty grains every three or four hours." I have always endeavored to proportion the quantity given to the apparent exigencies ; often repeating 10 grains, \mathfrak{z} i or \mathfrak{z} ss every two or three hours. My object is to employ the due amount ; in bad cases the maximum which will act upon the system in the mode desired. I believe there is little or nothing to be feared from an over dose ; except its rejection or escape by purgative action. I cannot agree with those who regard the remedy as possessed of too much power. I have often, alas ! found it endowed with too little.

The first stage of yellow fever lasts, as I have said, from twenty-four to sixty hours ; frequently somewhat longer. I succeeded in a very bad case in fifteen hours, by the frequent affusion of cold water and often repeated scruple doses. Armstrong, in his treatise on Typhus, tells us, that with far less impressive quantities he "procured the alterative operation of calomel within the first or second day." If the patient is seen early, then, we may thus outrun the progress of the disease ; if not, it is needless to tell you that no plan of treatment yet known can save him. It must be acknowledged too, by every one, that there occur in particular subjects attacks of such peculiar malignity as to bid defiance to all the resources of our art.

On examining our patients, if we find their mouths "touched," as the technical phrase is—sore from mercury—we are apt at once to discontinue the course. This may be a fatal error. We must judge considerably of the circumstances. In general, this

spunginess of the gums and tenderness of the teeth will be accompanied with proofs of a decline of the disease ; of its subsidence after having spent its force. But it is not always thus ; and we must not omit to make our victory secure by perseverance, if it show itself, as it too often does, still obstinate and tenacious. We do not bind up the arm when the pleuritic begins to draw his breath more freely ; nor withhold our opiates on the first relaxation of a constricting spasm ; let us here also guide ourselves only by the influence upon the original diseased condition or action excited by the new, substituted, remedial condition or action.

Perhaps the best evidence of the efficacy and adaptation of our heroic remedy here, may be drawn from this obvious opposition between the mercurial affection of the system, on the one hand, and on the other, the peculiar morbid action in which the disease consists ; alternating and struggling as it were, with each other, until one prevail to the extinction of its opponent. In the very words of an author already quoted, who nevertheless declares himself to have “no confidence in the efficacy of mercurials,” “a struggle for mastery appeared to exist between the disease and the remedy for a time ; while the fate of the afflicted patient hung in suspense. The establishment of a decided salivation became the harbinger of victory, and every untoward symptom disappeared.” It by no means detracts from the value of this strong statement, when we consider the neutral feebleness of the system pursued, that he alleges this fortunate termination to have occurred only in the milder cases. But why, in the more violent—why, in Heaven’s name ! did not the physician come to the aid of his remedy, “while the fate of the afflicted patient hung in suspense,” and by an increase of dose add to its salutary impression !

I must not dismiss this part of my subject, without a particular reference to the cases occurring in young children. At this early age, there is both difficulty and special danger in the attempt to induce in the system the mercurial action. Whatever may be the cause of the peculiarity, experience proves that it is almost impossible to effect in them the alterative influences of our remedy, as shown usually by salivation ; and the effort, if persisted in, has been known to end in the most unhappy results ;

the gums, cheeks and tongue inflaming, becoming dry and gangrenous, and sloughing at last, with every attendant detail of annoyance and agony. And it is to this peculiar condition of constitution in children, that forbids or contravenes the beneficial agency of our most powerful remedy, that I would ascribe, at least in part, the very great ratio of mortality among them.

There is no reason, however, for abstaining from the exhibition of calomel as the best of our purgatives, in the first instance; but we must soon desist from it, substituting oil of ricini, or some combination of resinous and saline quality, as the mixture of sal epsom, with rhubarb and an aromatic. The infusion of *serpentariae*, or if the stomach be unquiet, the alkaline diaphoretic, may be given; while the cold bath is employed in the mode indicated, and the epigastric region fomented or blistered as need may require. The stomach being soothed, the general irritability and restlessness of the little patient is subdued, and he sleeps tranquilly, while his skin is covered with a soft moisture. If the symptoms continue urgent, it will often be best to persevere with the administration of our mercurial, in small doses, with or without the creta: precipitata: watching cautiously, the least appearance of ill effect from it.

Yet even among children, of whatever age, if the attack presented symptoms of special malignity and uncontrolled rapidity of progress towards a fatal issue, it might become a reasonable question which of the two risks it would be preferable to encounter. I have confessed my apprehension of its injurious tendency, and my doubts of its general applicability to this class of cases, and acknowledged my unwillingness to resort to it. But you should be aware that we are not without examples of its admirable utility in these very exigencies. I have seen one child of about eight years of age, and two beneath five years, saved even after the occurrence of black vomit, by pressing boldly the mercurial treatment to its full extent; and my sincere good faith and conscientiousness in laying before you this statement, will scarcely be doubted, when I add, that among the latter was one of my own children.

Some of the anti-mercurialists, unable to deny the obvious success of the mode of treatment to which they objected, en-

deavored to explain all its benefit by a reference merely to the purgative effect of the calomel administered. And this led to a persevering and assiduous substitution of other cathartics, and their employment in an amount and for a space of time unheard of. This extreme was, perhaps, even more dangerous than that of Graves, of Dublin, who seriously argues against the supposition of any power in such drugs as curative of fever; committing the surprising mistake of regarding them as mere evacnants, and omitting all reference to their derivative or revulsive action, certainly their principal mode of usefulness. The exclusive purgative plan received in this city a fair and persevering trial under the auspices of a reverend gentleman of great and well deserved popularity. With infinite humanity he devoted a large share of time and attention to the sick, and to his kind care many, no doubt, owe their lives. The cathartic formula which he chose, as possessing a specific and peculiar efficacy, was a solution of Glauber's or Epsom's salts in an infusion of rad: seneka; and whatever objections may be urged against this course on the principles of Broussais or of Graves, numerous attestations are accumulated in its favor. The absurd extent to which it was carried, even by medical men, will be illustrated by a single fact. I was called to see a patient, in consultation, in 1824, on the third day of his illness, and but a few hours before his death, who had been purged by this mixture, as a careful attendant assured me, one hundred and forty times. The poor fellow himself affirmed that he had not been off the chair five minutes. These statements were fully confirmed by his physician.

The truth, on this whole subject, lies in a nutshell. In the first stage of fever, speaking generally, purgatives constitute an efficient and safe mode of depletion, and the mucous surface of the intestines affords an eligible diverticulum for the relief of organs subjected to vehement and dangerous determinations, so uniformly present whether as complications or essential elements. This revulsion or derivation being accomplished, it is absurd and worse than useless to press them farther, incurring, on one hand, the risk of inflammation, tympanitis, etc., and, on the other, exhausting the little remaining strength of the sick man.

We readily avoid these evils, by combining with our mercurial a proper amount of opium, or administering alternate doses of the cretaceous julap with kino, or a solution of acetate of lead.

The last named article was introduced into the practice in yellow fever by the late Dr. Matthew Irvine, of this city, a most sagacious and acute physician, author of a brief but valuable treatise on the disease. He employed it from the very commencement of the attack, either alone or in union with such other remedies as might be indicated, and regarded it as endowed with singularly beneficial influences in diminishing the inflammatory excitement of the gastric mucous surface; checking its morbid secretions; subduing its irritability, and thus restraining the frequent retchings and violent vomitings; and finally, as "a sub-tonic," enduing with new energy the exhausted and enfeebled organ. O'Halloran declares that he found the acetate of lead serviceable in relieving the irritability of the stomach. He administered it, while pursuing the mercurial treatment, in weak solution. In a similar manner, and with the same effect, he used a weak solution of sulph: zinci.

This is, indeed, a most distressing symptom, and one which calls loudly for sympathy and alleviation. Not only is it in the highest degree annoying and troublesome to the patient, but, by preventing the retention of our medicines, directly destroys all hope from their remedial efficacy, while the strength sinks rapidly under the nausea and violent retching. I have already spoken of the application of cups and leeches in the first instance, a measure unexceptionable, rationally indicated, but less serviceable for the most part than has been hoped for. Counter-irritation must, then, be assiduously persisted in. I prefer the early use of the mustard poultice covering the whole abdomen; after the febrile stage is past, the vesicatory must be resorted to. In the meanwhile, you may, if you choose, experiment with some one or more of the numerous formulæ suggested for tranquilizing the disturbed organ. Lime-water with and without milk, new milk alone, olive oil unmingled, the saline draught in the state of effervescence, the carbonates of soda and potass, the vegetable acids—orange, lime and lemon juice, even the mineral acids, the capsicum pill, and many other prescriptions are pressed upon us and recommended by excellent authority. Be-

lieving as I do, that the vomiting results from an irritation of an inflammatory character, I abstain from all palliatives of this merely empirical cast. I have derived benefit from the alkaline diaphoretic, and from small doses of opium; there is sometimes relief from ice in pellets, and from the iced soda water of the shops.

The head-ache is another of these symptoms from which your patient will most earnestly solicit relief. Cut off the hair, if thick or long, and pour upon the vertex a stream of cold water from some height, supporting the head over the side of the bed. Let the feet be placed at the same time in a hot and stimulating bath. In the second stage, a blister may be put on the back of the neck or between the shoulders. All these have I seen ineffectual in affording the slightest solace to one whose head-ache suddenly left him on his becoming salivated.

The management of the second stage of yellow fever, the remission of some writers, requires nice attention and assiduous care. We are especially to note the tendency to prostration so apt to develop itself at this juncture in manner and degree unexpected, and betraying the progress of insidious mischief by sudden collapse and black vomit. Cinchona in some mode of preparation will be useful, provided the stomach bear it well.

I prefer the infusion with an aromatic in small quantity, and a little alkali, carb: potass or soda; some choose the ordinary solution of sulph: quinine. Bark, in substance, was, in former times given, and in large amount by the West Indian physicians; but few patients are able to retain it. Camphor is very often agreeable and well borne. If a hemorrhagic disposition show itself, by oozing of the gums or tongue or sanguineous discoloration of the discharges, the acet: plumbi may be combined with it.

It is here I consider it best adapted—when this alarming symptom makes its appearance early, as occurred not unfrequently in our yellow fever of 1835. I used it with decided advantage in several such cases, though disappointed in its non-fulfilment of the general indications laid down by Irvine, and in the relief from gastric disorder spoken of by O'Halloran. Under similar circumstances I am pleased with the effect of the nit: argenti, which not only exerts evident control over the bleeding surface exposed, rendering the red tongue pale, and checking promptly,

especially when aided by pressure, the diapedesis from it, but when given internally, in does of 1-8 to 1-3 of a grain, improving the condition of all the discharges. Pledgets dipt in a strong solution of it, being taken into the mouth, stop the hemorrhage there, and enemata of the same solution aid us in arresting the intestinal flux. It is I think too little used among us.

Stimulants must be now resorted to, but with caution. Capicum is one of the safest and best. I object to its exhibition while the febrile excitement continues; but as soon as that has subsided, it may be administered. The pill is its best form; but even that may occasion an unpleasant burning and require to be desisted from. Opium is often of great benefit at this juncture, and in cases attended with great restlessness and mental dejection, should be prescribed in free doses. It may be combined with almost all the remedies necessary for our purposes, whether stimulating or astringent. After black vomit has come on, the spts: terebinth: has been alleged to be well adapted; I have not, however, seen advantage result from the prescription, and it occasionally irritates the stomach, increasing the sense of heat and burning. Epispastics should be applied over the surface extensively at intervals of two or three hours, so as to produce as much vascular excitement as possible. The inflammatory irritation which they give rise to in the urinary organs, has often been followed with immediate general improvement and ultimate recovery. This may be promoted by the internal use of the tinct: cantharid: which is also stimulating, and should be given in free doses. "I have never seen death in a single instance," says Rush, "in a fever from any cause where a strangury attended, and I have seldom seen a fatal issue to a fever where this symptom was accidentally produced by a blister. There would seem to be a connection between a morbid excitement in the neck of the bladder and the safety of more vital parts of the body." I cannot express myself quite so strongly as Dr. Rush, in his estimate of the importance of this mode of revulsion. I have lost a patient in whom I had succeeded by blisters and tinct: cantharid: in bringing on a severe strangury. Nevertheless, it is fairly indicated, and a hopeful measure.

Stimulant frictions may also be serviceable. The vegetable acids, vinegar and lime juice, mixed with common salt, are

rubbed over the body in the West Indies ; ardent spirit seems particularly cordial and refreshing. Applied with a sponge, its rapid evaporation produces a very pleasant and reviving coolness, while its odor is both grateful and stimulating. It often seems to remove in an instant the very distressing restlessness under which the patient labors, and to substitute for it a certain calmness and tranquillity. So much coveted, indeed, is this sponging, that I have often heard children cry anxiously for it, and adults earnestly entreat its frequent repetition. I have seen them turn over, after being thus gratified, and fall at once into a deep sleep, as if an irresistible opiate had been administered to them.

In the third and last stage of this pestilence, characterized by a dark bronze hue or the well known orange color of the skin, extreme debility and abundant discharges of black vomit, I have little to advise beyond a perseverance in the assiduous employment of stimulants. Of these the alcoholic are most to be depended on. Wine is rarely well borne or taken in sufficient quantity. Rum or brandy must be given with no sparing hand ; and if their pungency be complained of, it may be sheathed by mixture with milk, as milk punch, which I often prescribe, or with mucilages, arrow root, sago, rice gruel, and the like. Capsicum is much depended on by some practitioners, ammonia by others, turpentine by a few. Some mingle with the fluids taken a proportion of the mineral acids, the nitric, sulphuric or muriatic, which doubtless diminish the fœtor exhaling from the body and from the discharges.

The treatment of the congestive form of yellow fever is next to be spoken of, but will require from us only a brief notice. Your task here will be found indeed, a difficult one ; your patient is from the first moment of invasion in the most imminent danger. These cases, which happily for us, are not so frequent in our city as they seem to be in some of the other localities subject to this endemic, are chiefly characterized by deficient or impaired sensibility.

The patient is perhaps chilly, moans uneasily, is feverish and fretful, though dull ; when spoken to, he answers in a heavy, indifferent way. The skin may be pungently hot, as in the ordinary or inflammatory modification, but is usually relaxed and of

habitual temperature, dry perhaps—perhaps covered with a clammy moisture. The eye is reddened, suffused, and somewhat impatient of light; the arms are often thrown up, and the head rubbed and pressed as if it ached, though, if you ask concerning it, the reply will, for the most part, be in the negative; the mouth and tongue soon become dry, and of a dark fiery redness; in the first instance, the pulse is little altered; it may be somewhat contracted and irregular—sometimes frequent, sometimes otherwise. The disease advancing with quick and steady step, the patient sinks into stupor and coma—the pulse is full, but very soft, and soon losing its volume, becomes rapid, unequal, undulating. An offensive odor exhales from the body, now of a copper or mahogany hue, black vomit supervenes, and death ensues early.

Under such circumstances as these, it is evident, that our practice must be modified so as to adapt it to the varying exigencies that press upon us. The very great prostration occasioned by the vehement impression of the morbid cause of the attack, demands imperatively that we shall at once enter upon the measures best calculated to produce general excitement and promote re-action.

Of these, the hot bath claims decidedly the first place, both in point of time and importance. To effect our purposes, the temperature of the water should be as high as can be borne, say 100° of Fahrenheit at least, and the patient, while immersed in it, rubbed briskly with the hand, a flesh brush or roll of flannel. We may make the bath still more stimulant by the addition of common salt, spirits, or mustard. On taking him out, sinapisms, or rather mustard poultices, should be applied extensively and assiduously to the surface of the patient, the epigastrium especially, and along the spine, the ankles, legs, thighs and arms. It is difficult to speak too strongly of the beneficial effects of this mode of irritation in rousing the energies of the vascular and sensorial systems, now enfeebled and paralyzed to the greatest degree consistent with life.

If he continue, under these applications, still torpid and chilly, though well covered and surrounded by heated bodies, bottles of hot water, bags of heated salt, and the like, I would replace him in the bath, the temperature of which should be raised as high

as may be without injury. An active emetic will sometimes succeed in rousing the system from this state of torpor. Some prefer the tart: antimon:—others ipecac: both which require to be given in large quantity, and are, therefore, not at all unlikely to depress the vital powers seriously, if they fail to procure their own expulsion. I avoid them, therefore, choosing some of the quicker emetics, as the sulphate of zinc or the sulphate of copper, or the more stimulating, such as salt and mustard, which seem especially adapted here, and will operate promptly and impressively. Stimulating enemata, too, should be administered without delay; the solution of table salt, the turpentine emulsion, or ardent spirits, properly diluted, may be employed.

It is, I imagine, (for the particular contingencies have not been clearly defined,) in this class of cases, that the enormous doses of sulphate of quinine to which such important influence has been attributed—it is, I suppose, in these congestive cases, that these quantities of sulph: of quinine have been prescribed with so much benefit.

I have had hitherto no opportunity of carrying out the plan so loudly eulogized, but will readily make trial of it when the occasion shall offer;—10, 20, 30, and even 50 grains, we are told, have been taken at once with satisfactory results.

We are not, however, to neglect the diffusible stimulants, which must be freely exhibited. The spts: of turpentine will be found, at this juncture, it is affirmed, an invaluable remedy. Where full doses are used, it is said to be doubly serviceable, as inducing a safe cathartic operation on the bowels, while it excites the system most agreeably and quickly. Camphor, carb: ammonia, wine, capsicum, and ardent spirits, must be taken alternately and combined, and in such modes of preparation as may suit the caprices of a stolid or wilful subject, and remain best on his irritable stomach.

I have found opium one of my most available excitants; but it must be administered boldly, and its effects kept up by repetition. I was led to its use by the obvious analogy which, in one case, I found to exist between the actual condition of the patient, and that with which I was so familiar in delirium tremens. This patient, a gentleman of the most correct habits—temperate and studious, lay feeble and almost unconscious, trembling and

muttering and moaning, while the blood oozed constantly from his mouth and nostrils. He was restless, sleepless and highly incoherent. He took opium, in 3 grain doses, at an interval of two hours, for some time, while his strength was supported by the infus: cinchona with mucilages and brandy. He recovered.

It is scarcely necessary to say, that, in the meanwhile, the mercurial should be introduced as rapidly into the system as may be, alone or in combination with the formulæ above advised, and externally by friction and as a dressing to the blisters which should be substituted for the sinapisms applied at first. As affirmed by Armstrong, so I also have seen all the peculiar symptoms of congestion subside upon the earliest token of the mercurial affection; the weak pulse become fuller and regular; the cold, harsh skin, covered with a genial moisture; the dry tongue softened, and the incoherent wandering cease; and the whole desperate condition of the sufferer improved into absolute convalescence.

The recovery from such a pestilential malady as we have been considering, must, of necessity, be slow and tedious, and more or less irregular. The diet must, for a good while, be mild and light, consisting of the vegetable mucilages, after which, milk and eggs may be allowed, and a gradual return to former habits permitted.

A few words in conclusion. I have endeavored to impress you with the force of the observation so often made in regard to yellow fever, that the life of your patient depends upon your treatment of the early stage—the febrile or first stadium of his disorder. Yet, however he may sink, no matter in what seemingly hopeless state of prostration you may find him, you are never to desert him. Such strange and unlooked for recoveries from the most desperate circumstances, are recorded in our histories of this disease, that a proper regard to your own reputation, as well as the conscientious determination to perform your duty to the last, demand that you should persevere in the most assiduous efforts to restore him.

Even when there is no pulse at the wrist; when subsultus tendinum convulses every limb; and at every hiccup the stomach ejects the odious black vomit, you must not remit your earnest exertions.

Ardent spirits, capsicum, æther, ammonia, and any other, or all other stimulants, must be given him in succession or combination. I have repeatedly seen the hiccup cease, the vomiting subside, and the strength and vigor of the patient return, under the untiring repetition of these remedies. It is true, that instances of such success are not of every day occurrence ; they are sufficiently numerous, however, to prove that a very large proportion of deaths in yellow fever are attributable to exhaustion, rather than to organic lesion ; and hence, to urge upon us the necessity of persevering, to the very last moment of existence, in our indefatigable endeavors.

In all the stages and circumstances of this malady, of whatever form, you must give the sick man fresh air. If his apartment be close and ill-ventilated, he must needs die. The majority of deaths, as you were told, occur on the fourth, fifth and sixth days ; surviving beyond that period, he will either convalesce slowly, or subside into a typhoid sort of condition, in which the system is so torpid as, for the most part, to refuse to respond to any of your remedies. Still, you must not despair. Give him artificial life, as far as possible, by means of all the stimulants in your reach ; keep up as well as you can this species of excitement ; and though, in the far greater number of cases, you will fail of effecting the restoration, or resuscitation, as it may not improperly be called, of your patient, yet you will now and then enjoy the glorious triumph of saving him from the very jaws of death ; thus richly meriting the civic crown of oak leaves, which the Romans placed upon the head of him who had in battle saved the life of a fellow-citizen.

CHAPTER VIII.

CATARRHAL FEVER.

It is not usual, to arrange under our present head of Idiopathic fevers, the form of disease which is now about to engage our attention. In a very large proportion of the cases to which the name of catarrh is given, an inflammatory affection of the mucous membrane of the respiratory apparatus—a true bronchitis of greater or less intensity, forms a prominent, perhaps the most prominent symptom. Hence, some writers designate it as a mere modification of bronchitis; while others, regarding it as a specific disorder of the respiratory organs, consider the local affection as of paramount consequence, and the febrile irritation of the general system as secondary, symptomatic and incidental.

But these are narrow views of a topic of peculiarly vivid and striking interest. Catarrhal fever, as occurring sporadically and epidemically, is perhaps the most common of human maladies, and may be affirmed directly and indirectly to constitute the widest outlet of human life. Let us notice how many fatal cases of consumption owe their origin to the “common colds” of every day familiarity; let us look over the bills of mortality when influenza prevails, and we shall be prepared to estimate this matter correctly. It is stated that the number of deaths in the city of London from epidemic cholera, was less by a considerable amount than that produced by the next year’s invasion of influenza; and we are told that the grippe, when it assailed New-York in 1843, at once doubled the usual or average weekly list of deaths. We shall see, when we come to detail the history and symptoms of the disease, that the local affection to which such undue prominence is given, is by no means invariably striking in degree; nay, that it is not unfrequently wanting altogether. In describing the London influenza of 1833, Watson says distinctly, “the catarrhal affection is sometimes absent or imperceptible.” The head is sometimes exclusively attacked; the schneiderian membrane, the membrane lining the frontal sinus and antrum maxillare; the conjunctiva; the locomotive

apparatus, the muscles and joints, often bear the whole onus ; and particular epidemic vitiations are designated, on account of this rheumatic or arthritic character, as "break bone fever ;" while others are characterized by extreme muscular debility. Richter, "*nomen clarum et venerabile*," considers catarrhal as nearly or quite identical with rheumatic disorder ; and there are many facts and reasonings which go to render his opinion plausible, though I am not disposed to contend for its truth or absolute correctness. The mucous membrane of the stomach and intestines has been noted as being so liable to be deranged in connection with influenzas, that Holland, recording the concurrence of dysentery with epidemic catarrhal fever at various periods, as in London in 1762, and again in 1833, and in 1837, says, that "the fact is so well established by repetition, that it is difficult not to suppose a direct connection, either in the nature of the cause, or in a liability, created by the prior disease, to be affected by the ordinary cause of the latter." This concurrence of the two was remarked in New-York, in August, 1843.

All these circumstances being duly taken into account, I cannot help concluding that the bronchial inflammation, though a very general element of catarrhal fever, is a feature altogether subordinate to the constitutional derangement, and holds the same relation to it as the hepatic affection of remittent and the gastro-duodenitis of yellow fever. The name, which is based upon and suggestive of error, is so fixed by long and universal usage, as not to admit of any change. Alison, while he describes it as "consisting essentially in bronchitis, with certain accompaniments," tell us, nevertheless, in the very same breath, that "it is always attended by or forms part of a constitutional fever ;" and the same inconsistency will be found to run through the views of all who regard it as one of the phlegmasiæ, rather than correctly an idiopathic pyrexia.

The Symptoms and history present, as has been already stated, a very great and interesting variety. Beginning with the simplest and most ordinary sporadic attack of a mere cold, as the phrase is, we shall notice first, a thickening and dryness of the nostrils which are full or stuffed ; there is heaviness of the head, especially along the sinus above the eye-brows, and some aching of the face and jaws. After a time the eye reddens and weeps, and

there is coryza, a very large discharge of thin serum flowing from the nose, which often becomes so acrimonious as to inflame the upper lip, and excites frequent and violent sneezing. This "cold in the head" may and does often constitute the whole of the disease. In a grade of increased severity, we have the above ailments combined with a sense of chilliness, while the skin is warmer to the touch than is natural, and dry and harsh perhaps; there is oppressive, and it may be, very violent headache. Next comes on a feeling of rawness, soon aggravated to soreness in the throat and fauces; which extends to the larynx, trachea, bronchi, and thorax generally, accompanied with an uneasy tickling and urgent disposition to cough. The cough is rough and painful, and at first dry and hoarse, as is the voice; but after a while, a tenacious mucus is expectorated, which, becoming thicker and thicker, assumes the color and appearance of pus, its discharge being attended with relief. The pulse is frequent and rather hard, but not very full; the skin hot and dry; the tongue white and furred. Pains in the back and limbs and aching, as if in the very bones, often exceedingly distressing, render motion annoying; and the patient complains of stiffness in the joints, with more or less languor and debility. There is also, for the most part, an inordinate and unaccountable gloom and dejection of spirits; Rush quotes an invalid under his care as saying, that the fever not only deserved the familiar name of "break bone," but should be called the "break heart" also. The fever is distinctly of continued type, reaching its acme about the third or fourth day, and running an average course of about a week; the height of the exacerbation is usually in the evening, when all the symptoms above detailed are apt to be aggravated; the cough especially becoming more troublesome, and connected with more thoracic soreness, tension and stricture. The thirst is increased, and there is perhaps gastric uneasiness, with restlessness and jactitation. I have said that the skin is commonly hot and dry; and there is an old and prevalent notion, that of all febrile maladies this is the one most intimately connected with if not dependent upon a diminution or suppression of the natural and healthy cutaneous transpiration. But daily observation shows us, that no such suppression is necessarily present here. Although, like other fevers, apt to bring on or concur

with this condition of the surface, yet like them it is liable to not unfrequent exceptions in this respect. I have seen many cases indeed, in which the perspiration was unduly abundant; and some in which the sweat was not only increased in quantity, but obviously vitiated also in quality, being of acid or other disagreeable odor, and discoloring the body-linen.

The general Prognosis in catarrhal fever is favorable. Under ordinary circumstances, the febrile excitement subsides from the fourth or fifth day, and the patient recovers with a gradual decline of the cough, his expectoration becoming easier and more abundant, and consisting of muco-purulent matter. In adults of middle age and average condition it is rarely fatal, except by exciting into action some other more tenacious or destructive malady. The tendency to phthisis pulmonalis belonging to individual deterioration of system or hereditarily derived, is very often developed, or at least hurried forward by it. Chronic bronchitis sometimes retains a tedious and tenacious hold, and asthma has been known to follow it. Pregnant women, when attacked by it, are very liable to uterine hemorrhage, and abortion, or premature labor; and it has been made a question upon this observed fact, whether there were any specific tendencies in the nature of the existing irritations to affect the uterus, or whether this organ takes on its morbid and contractile excitement merely from the so-often-repeated mechanical agitation of the trunk by coughing.

In old people we have, prominent among the effects or contingencies which we are now discussing, that condition of the lungs known in the books as *peripneumonia notha*, an effusion of mucus taking place in the air cells and bronchial tubes so rapidly and in such abundance as often to menace, and in very infirm subjects sometimes to occasion absolute suffocation. The same sort of termination may be presented in young infants, or we may be annoyed and alarmed by the supervention of laryngitis, and this combination of inflammatory croup is apt to prove obstinate and dangerous. In children of rather more advanced age, especially when dentition is going on, the mucous membrane of the digestive tube is very frequently implicated in a degree which requires special attention. In these little subjects, the cough is perhaps the symptom earliest observed, dry and hack-

ing at first, and soon accompanied with some thoracic rattling and wheezing, and more or less embarrassment and hurry in respiration. As night comes on, fever rises high, with hot, dry skin, and a pulse of great frequency, hard and jerking; there is extreme and distressing thirst; determination to the head is very likely to ensue, with flushed face, red and suffused eye intolerant of light; on the one hand, there may be drowsiness increasing progressively to stupor and coma, or on the other, an uncontrollable restlessness agitates the sufferer, who tosses incessantly, moaning and throwing his arms upward, rubbing and pressing the scalp, and finally falling into violent convulsions. Or the stomach is assailed with vehement irritability and frequent retching, rejecting every thing offered. In a case of this kind occurring under my care in March, 1821, a child of about three years of age threw off a quantity of fluid resembling coffee grounds, not in any way distinguishable from the so much dreaded black vomit of yellow fever. He recovered, however. My friend and colleague, Professor Moultrie, informs me that the same thing happened to a young patient of his laboring also under catarrhal fever, in December, 1834. In these gastro-intestinal attacks we shall find the tongue at first whitish or covered with a yellow fur; soon, perhaps, assuming a dark red or brownish hue, inflamed or ulcerated, as is often the whole lining of the mouth and fauces; the bowels are much disturbed, the stools being greenish or otherwise discolored, or thin and serous and acrid, so as to inflame the anus and neighboring surface, and give rise to great pain at the time of an evacuation. The duration of this class of cases is usually from six to ten days, and the termination doubtful.

A favorable prognosis may be drawn from the decrease of thirst and of the great frequency of pulse, the skin becoming soft and moist, and the alvine discharges less acrid and more naturally fecal. Convalescence is, however, always slow, the cough continuing for some time, with more or less embarrassment of respiration; as the patient cannot yet be taught to assist expectoration by any definite or voluntary effort. Besides the mucous rales which belong to the history of all catarrhal affections, auscultation will offer you in young children a varied com-

bination of sounds, cooing, purring and sibilant, which exhibit the thickening and partial occlusion of the bronchial tubes extensively through the lungs; while there is very little loss of resonance or percussion, proving that the capacity of the cells is much less impaired. This state of things is protracted, as I have witnessed in more than one instance, for months and years. On the other hand, an increase of the frequency of pulse, which is often incalculably great; more urgent thirst and retching; unchecked diarrhœa, perhaps running into dysentery; more and more difficulty of breathing, sometimes produced not by mere accumulation of mucus, but by actual congestion, either passive or inflammatory; the occurrence and repetition of convulsions, or the supervention of coma, mark the downward progress to a fatal issue.

We meet occasionally, even in adults, with this combination of intestinal with gastric disorder, which I have just been describing as more common among the infant subjects of catarrhal fever. Here, there is nausea, with discharge of vitiated bile and porraceous matter, both upward and downward, sometimes alternately, sometimes concurrent with cough and difficult and painful respiration, the expectoration being scanty, and consisting of aropy tenacious mucus.

The disease, as I have thus portrayed it, is among us, in this climate and locality, and indeed, as far as I am aware, over our whole American continent, usually inflammatory in its character, and very rarely assumes the contrasted features of the typhoid or low variety of febrile movement. From the testimony of the writers of best authority, however, this would seem to be its most general form of prevalence in Europe, in large cities especially, and when it exists as an epidemic.

Alison tells us "that a remarkable degree of debility is an essential part of the constitutional fever of influenza, which, from that cause, is often very dangerous to old or feeble persons;" and Watson uses such language as to make us suppose that he regards this vascular and general prostration as the most uniform and essential element in its history.

I have met with very few instances of this nature, and these have been almost exclusively among our negroes, who, being

but imperfectly clothed and badly protected in their sleeping places from cold, have yielded to its distressing influences in the hard weather of our more severe winters.

Such attacks are attended with the well known evidences of sensorial derangement and vascular prostration. In addition to the catarrhal or bronchial disorder, there is often violent and heavy headache with muttering delirium or moaning, great languor, despondency, oppression at the precordia, profound sighing, the pulse frequent, irregular, soft and feeble, the heat of the body varying, but often below the natural standard, and the skin moist and relaxed, with tendency, not rarely, to profuse sweating. The tongue is dry and dark, the teeth and lips covered with sordes, the breathing exceedingly hurried, sibilation is heard within the lungs, and the resonance and respiratory murmur much impaired. Death is usually preceded by coma.

The Causes of catarrhal fever are, perhaps, as widely distinct as any agencies in nature. Some of them are perfectly well known and familiar, while others are enveloped in the deepest obscurity. Sporadic or individual attacks are ascribed with definite certainty to contingencies which can be repeatedly experimented with. A cold follows exposure to night air, sitting in a strong draught or near a window, or getting the feet wet, or sleeping in damp sheets, or being caught in a thunder shower, or remaining long unprotected in inclement weather: these are unquestioned facts as regards susceptible individuals. Next, we have great numbers of persons attacked at once, upon any very sudden and remarkable change of temperature, whether the thermometer rises or falls. Colds are always common in the changeable seasons of autumn and spring. Every one protects himself from the immediate impulse of a change from heat to cold, and the universally received theory is, that the cutaneous transpiration is suppressed by such change, and thus that disease arises. But the opposite alternation is not less dangerous, probably, when the same explanation will not apply. Martaeus tells us, that on a very cold winter night in 1782, the thermometer at St. Petersburg, suddenly rose thirty degrees; next morning not less than forty thousand people were attacked with catarrhal fever.

Farther, there are particular winds which every where are known to favor its prevalence, independently of any change of

weather from hot to cold, from dry to damp, or vice versa. The south east wind in England, is charged with this influence. It brings with it, says Watson, "a haziness seen in the country, remote from smoke, and quite distinct from fog." He goes on to ask, "What is this haze? has it any connection with the morbid quality of this wind?"

Nothing, however, can be more clearly made out than the absolute independence of catarrhal fever, as prevailing epidemically, upon any of the sensible qualities of the circumambient air or upon any cognizable conditions of the atmosphere—electrical—barometrical or thermometrical. Although sporadically producible, as I believe, by all vicissitudes in these qualities and conditions, yet it prevails in masses without any reference to them. I have seen it general or extensively prevalent here in every month of the year in different years. *Influenza*, an Italian word originally, is now universally employed to refer to this indefinite extension of the disease, which has by the great majority of pathologists been ascribed to contagion. Cullen calls it "catarrhus, a contagione." Alison adopts the phrase, and speaks of it as a "contagious disease." Holland and Williams dwell on the similarity of its progress and propagation, with those of Asiatic cholera—the former being apparently inclined to attribute them both to animalcular irritation. Watson does not refuse his assent to the received doctrine of its contagiousness, and maintains definitely, that it may be generated by a cause both "material and portable." The nature of this cause is not made out, but its actual existence, to use his own words, in "a material and portable" form seems scarcely to admit of a doubt. The suddenness of its invasion and the potency of its influence, are alike remarkable. "In one of the London prisons," says Holland, fifty or sixty persons fell ill of it in one day; and I have often known in private practice, six or eight in a house seized with it in twenty-four hours." Watson relates a singular story in illustration of this point. In April, 1833, the English ship *Stag* approached the Devonshire coast, with all hands in good health. Within half an hour after reaching a certain distance from the shore, the wind blowing out to sea, there were forty men down with influenza; in four hours sixty; and in twenty-four hours one hundred and sixty. On that very evening, there was a regiment

in Portsmouth, with every man well, of whom, on the next morning so many were sick with influenza, that the garrison duty could not be performed; and in very strong language the same author states, that on those two days, (April 3rd and 4th,) "all London was down, smitten with it." We are able to trace the agency of this peculiarly obscure influence at sea, as well as on land. "In May, 1782," says Good, "Lord Anson sailed with a fleet for the Dutch coast, and Admiral Kempenfelt, for that of France. The crews of both fleets were well on sailing, but in the same month both were attacked very generally, and the latter was obliged to return home to recruit." It seems to have made its appearance in the most distant regions almost simultaneously, or has swept over whole continents with amazing rapidity, and even crossed the Atlantic repeatedly. The influenza of 1781-82, is said to have appeared first in China, to have travelled thence through Asia into Europe, and to have reached our New World in the following year. It prevailed in Russia in February and December, 1781; we read of it in England in April and May, 1782; and in the same autumn in Spain and Italy. Huxham describes it in 1733 and 1743, Sir George Baker, in 1762, Sydenham still earlier, 1675. All these are identical with the influenza of to-day. Of the more recent dates, we have the European epidemics of 1831-33-37, each very extensive. In Copenhagen, early in January, 1837, Dr. Otto says, that at least thirty thousand persons had it at one time. Within six or seven weeks Dr. Holland supposes that half the population of London, say six hundred thousand, suffered under it. It was calculated to make progress in the same general direction as cholera—westwardly, and about as fast—eighteen miles per day; and in many places was thought, I know not upon what details of evidence, to have been imported, as at Norwich and Exeter in England, and at Lisbon in Portugal. During its prevalence, every where, it intermingles like other epidemics, its characteristic symptoms with those of any co-existent diseases and forces them, as Rush has it, "to put on its livery."

Now, as to the nature of this undefined and potent agency, to which we must ascribe the sudden invasion, steady propagation and vast extension of influenza, there has been no want of conjecture and speculation. Setting aside the contagious property

which seems to be very plausibly regarded as one of the elements, but which does not afford us a relevant and satisfactory explanation of the phenomena, there are suggested three sources of a poisonous agent capable of producing the effects above recited. I have already alluded to the animalcular theory of the generation of epidemics, which has found favor in the eyes of O'Neale, Henle, Holland, and others, but which is established by no positive proof. Next, we have the analogy of the hay-fever of England, as pointing out the possible diffusion of a vegetable irritant, through the atmosphere, which excites into catarrhal disorder the susceptible systems of some individuals with ascertained certainty. We have several such instances on record, on the authority of Gordon, Bostock and Elliotson. The first supposes the efficient property to reside in the aroma of a sweet-scented meadow grass, "*anthoxanthum odoratum*." Not only are the effluvia from a hay field or a stack of hay, thus influential in bringing on catarrhal fever, but we have the story of a lady who suffered an attack on the approach of her children, after they had been allowed to play in a hay field. I do not know of any similar statements in reference to our own country, nor am I aware that we cultivate the particular variety of grass above designated. It is enough to state that there is no established coincidence between the invasion of influenza and the progress or condition of any known form of vegetation. Lastly, Prout tells us that the seleniuret of hydrogen when breathed in the laboratory, will bring on catarrh; and a friend of mine has been severely attacked from inhaling chlorine and some of its compounds. But these are vague conjectures or hints at analogies, which fail to throw any light upon what Sydenham so long since called the epidemic constitutions of the air, the most potent and most obscure of the influences which give origin and prevalence and extension to diseases.

I am most concerned in the inquiry, whether the material morbid poison elaborated in some great store-house of nature, and active in the prompt or instant generation of hundreds of cases in a given district, is identical with the contagious exhalation almost universally allowed to be produced and given out by a diseased body. The logical rule, that like effects are always to be ascribed to like causes, is subject, in pathological discus-

sions, to so many known exceptions, that it is not to be regarded here, as safe foundation for our reasonings. In the present instance, to give an example, we have traced catarrhal fever to vicissitudes of weather, including an immense diversity of contingencies; to individual exposures to impressions upon the cutaneous surface; to specified irritants of vegetable and of mineral origin; to contagion probably, or an animal exhalation from a diseased body; and certainly, to a diffused and transportable atmospheric principle of evil.

It is from philosophical inquirers, like Holland, whose "Medical Notes and Reflections" are worthy a place in all your libraries, that we are to hope for elucidation of these dark and difficult topics, whose obscurity both baffles and interests us. The mere technical observer, though he may afford us aid perhaps, by some incidental remark, occupies too narrow a field and is guided by views too contracted, to allow the discovery of a great truth, unless by accident.

Of the Treatment. If you are sufficiently early warned of the approach of a cold, catarrhal fever or influenza, you will often be able, though not uniformly, to arrest its progress and escape the visitation. The premonitory, or rather incipient symptoms are too well known to every one. When assailed by these, which differ somewhat, yet not greatly, in different individuals, the gravedo or sense of fullness and heaviness of the forehead just above the eyes and along the frontal sinus, attended with dryness and stuffing or tickling of the nostrils, and frequent sneezing, with or without rawness or slight soreness of the throat and chest, and inclination to cough—a full dose of opium should be promptly prescribed and the patient put to bed. This practice was recommended many years ago by Young; it is highly extolled by Professor Chapman, who bears the most pointed and positive testimony to its efficacy; and I can truly assure you that I have frequently had occasion to witness in others, and to experience in my own person its excellent and very pleasant effect. After long familiarity with this prescription, I was amused to see it mentioned by Watson, in his valuable Lectures, as the recent and accidental discovery of a friend. I do not know that any one of the preparations of opium de-

serves a preference over the others. If, as is supposed, the *modus operandi* consist in a combination of stimulant with diaphoretic action, perhaps the Dovers powder should be chosen. I have found the tincture alone, or the camphorated tincture, very well adapted. One thing I would insist on; the amount should be sufficient to ensure sound sleep. This is a state of the animal body which, though it favors the invasion of some maladies, suspends the morbid action in which others seem to consist, and if not absolutely curative in others still, gives us a very serviceable interval of remission and relief. To apply these remarks to our present subject; I have often observed that when I have gone to sleep, laboring under the annoying inconveniences of a severe cold, I have frequently awaked almost unconscious of them, and have enjoyed for a notable period, greater or less, this comfortable intermission, until their gradual return gave proof of the dependence of my tranquillity upon the state of repose just passed away. Besides this, we have here the equable warmth of the bed clothing, and the avoidance of all additional sources of disturbance to the animal movements. Let it be noted, however, that this remedy is far more likely to produce a beneficial effect in averting an accidental attack, one which is about to follow a transient exposure, than in preventing a participation in an epidemic influenza, whose diffused cause is ready again to assail us with an inevitable and irresistible energy.

There is, perhaps, a point in the forming stage of sporadic catarrhal fever, in which stimulants generally may be serviceable; probably by imparting energy to the sensorial system and raising the vascular action above the point of morbid excitement, as dependant upon the cause which has been applied temporarily, and substituting for it that which is built up by the agent exhibited. Popular opinions of long standing, are rarely destitute of some foundation in truth and nature; a philosopher has said, that the collected wisdom of ages and nations may be found in their proverbs; and the stimulating plan of treatment is pointed out proverbially in the present case. I must be understood, however, to confine these remarks distinctly and exclusively to the forming stage of the attack, and to promise you much the most benefit from the management proposed when the cause has been

transiently applied and is no longer allowed to act—a condition that we can never be secure of during an epidemic visitation of influenza.

I have said that with us, catarrhal fever, when developed, assumes promptly and most evidently, in the vast majority of instances, the inflammatory type, and of course, will require for its palliation and removal remedies of diametrically opposite character—measures of depletion, and a regimen decidedly anti-phlogistic.

It may be necessary in a young and robust subject to premise venæsection, and this the more readily if the season be cool. Bleed from a large orifice and in a full stream, so as to obtain the most immediate influence upon the circulatory function, with the least actual loss of blood. It will not often be requisite to repeat the operation, but if the same symptoms which indicated it continue or return, while the pulse is firm and the strength unimpaired, you are by no means to shrink from it.

The cathartic will now aid in reducing to its proper level the vascular excitement; while we derive from the head and throat by determining to the gastro-intestinal surface. There has been some theoretical objection made to the combination of a diaphoretic with our purgative formula; but this is a nicety deserving of little attention in practice. We shall effect a very good purpose by the administration of some one of the neutral salts, with such a proportion added of tartarized antimony, as may induce general relaxation, slight nausea and free diaphoresis. But if the tokens of gastric oppression and derangement show themselves prominently at this early stage, with nausea or ineffectual retching, and a tongue much furred or of yellowish or brownish color, it will be best to commence the treatment with a mild emetic—of ipecac perhaps—followed by a mercurial cathartic.

The emetic is also definitely indicated, when there is a special degree of dyspnœa with or without cough; when the mucous rûle is local and constant, and the complexion pale or livid. These are symptoms most often met with in children and old people. Quick vomiting, without depressing nausea, should be aimed at; the sulphates of zinc and copper are preferred by some. In cases of notable feebleness, I choose mustard alone or combined. In the medium class of patients, lobelia is a good emetic.

In a large proportion of examples, we may derive best advantage from the exhibition—after the measures above recommended have been premised—of small quantities of tartar emetic, such as the stomach will tolerate; with or without opium, as the morbid action may extend itself most prominently to the head or chest. This combination will relieve cough and dyspnœa, bring on a pleasant cutaneous transpiration, and dispose to sound sleep. The narcotic must be avoided, if there be much cerebral disturbance—at least until the morbid excitement is abated. With a little management, 1-6 or 1-8 of a grain every second hour will be quietly received;—but if the stomach obstinately refuse to bear the antimonial, we must substitute the nitrous mixture, or the infusion of serpentaria, or the spts: mindereri, with nitrous æther. The alkaline diaphoretic is well adapted to the cases of infirm adults and young children.

As time advances, the more stimulant diaphoretics come to deserve a preference. Dovers powder, in full dose, must be given at night, with or without hot drinks; the carbonate as well as the acetate of ammonia, is now useful; squill, paregoric elixir and the nitrous æther, may be added in free doses. It is at this stage also that you will derive decided benefit from the application of vesicatories—a practice much talked of, very generally resorted to, and often abused. From the very first, you may sooth the thoracic stricture and uneasiness, by the assiduous employment of warm fomentations and poultices, with or without mustard. These may be renewed or alternated, as circumstances shall require; but if there be great relaxation of the surface, with inordinate sweating, as sometimes happens, we may substitute dry heat, by laying about the thorax and to the trachea, bags of hot bran, salt, and the like.

If too early applied, the blister will perhaps annoy your patient and increase the general and constitutional irritation which is present, thus preventing rest and sleep. After proper depletion, these unpleasant consequences are not to be dreaded, and when well timed, it is capable of excellent benefit; suppressing by prompt revulsion the mingled tendencies to mucous and serous inflammation of the lung, bronchitis, on the one hand, and pleurisy, on the other. Nor is its good effect confined to the removal of morbid determination to the thoracic viscera; when laid upon

the back of the neck, or between the shoulders, it often relieves the severe headache so commonly associated with catarrh.

The frequent cough will, in a majority of cases, demand your attention. It is apt to be exceedingly troublesome, augmenting the uneasiness and soreness of the air passages, which give rise to it, and increasing the force of reaction or general disorder, by depriving the patient of repose and sleep. For its palliation, there are proposed innumerable and strangely diversified demulcent drinks or cough mixtures, as they are usually termed. These have for their common basis some mucilaginous infusion or solution, as of liquorice, gum arabic, flax seed, elm tree bark, etc. etc., rendered expectorant, diaphoretic and anodyne, by the addition of oxymel scillar: vin: antimon: æther: nitrous, tinct. opii, etc. Indeed, it is to the judicious exhibition of opium, in some of its forms of preparation, that you are chiefly to look at this juncture for the solace of your patient. As expectorant and sudorific, it has neither substitute nor second; and when properly managed, will be found promptly to allay irritation and resolve pulmonary congestion, without exciting any undue vascular action, or developing any new or threatening symptoms. It may be repeated, *pro re nata*, through the day, in small doses; but should be given in full amount at night, to procure repose and tranquil and restorative sleep. A caution is found in some of your books, not to offer it where the tongue is dry, and there is present stupor or heaviness, with tendency to coma. I cannot see any indication likely to arise, under such circumstances, to tempt you to resort to it; when such sensorial torpor exists, measures should be taken not to sooth, but to arouse the functions. Mustard and epispastics externally, and ammonia with ipecac or camphor, are required.

Catarrhal fever, whether occurring sporadically or as an epidemic, usually runs its course in about seven days; but like most other "self-limiting diseases," so called, and so much dwelt on by the temporising school of practitioners, admits of being arrested, as I formerly stated to you, under favorable contingencies; and is also, besides being obviously palliated by proper treatment, abbreviated notably by suitable care, or disposed to protract itself under unfavorable management. This protraction is sometimes owing to a renewal of the primary morbid impres-

sions as it would appear, allusion to which is found in the familiar phrase "taking fresh cold;" and sometimes to a sort of chronic fixation of the local affections which form elements of the malady in its full development. Thus in subjects constitutionally or hereditarily predisposed to phthisis, the subsidence of the febrile attack is not followed by a return of health. A sense of stricture across the thorax remains, forbidding a full or free or deep inspiration; there is dullness of resonance on percussion at some points of the chest; the respiratory murmur is impaired at those points, and sibilation or the mucous r le is heard; a cough teases during the day, but is especially harrassing at night on going to bed, and perhaps too on rising in the morning; your patient will tell you that although he has a good appetite and indulges it reasonably, yet he continues weak and easily fatigued, and is becoming emaciated, and that he is apt to sweat while in bed. Under circumstances like these, it will not be prudent to neglect your convalescent, however slight his complaints may seem at first view. He is in fact on the verge of a precipice, and all your skill and judgment will be required to save him from the fatal excitement of his morbid proclivity to tubercular disease.

Less is to be done here, however, generally speaking, by the use of medicines, than by careful management in other respects. The diet should be regulated; in the majority, it is best to be made exclusively vegetable, with the single exception, perhaps, of milk, which experience has shown to be well adapted to such cases, as unstimulating and easily digestible, while highly nutritious. There are instances, however, in which a far more generous diet must be allowed—of eggs and broths and dishes made sapid and exciting. Indulgences of this sort must be watched very cautiously, and their effects noted, as guiding us in our further regimen. Confinement to the chamber or the house may be requisite, if the season be changeable or the weather inclement; but when the skies are favorable, and his strength sufficient, let him ride out in a carriage or take the air on horseback, and thus gradually return to his ordinary habits of life.

The inflammation of the lining membrane of the frontal sinus and antrum maxillare, so often forming one of the incipient ailments of catarrhal fever in all its varieties, not unfrequently

becomes, in its course, a prominent symptom, and sometimes remains tenaciously fixed, constituting, as I have witnessed in several instances, a singularly painful and indomitable tormentor. The strangest part of its history, is the disposition which it exhibits so strikingly and so promptly, to assume a regularly intermittent and periodical character. The patient, after suffering a day or two from what seems mere head-ache, notices that soon after waking in the morning, perhaps comparatively comfortable, the nostril of one side, or, though rarely, it may be, both, shall begin to feel full and obstructed; there is aching in the eye, above it under the eye-brow, and below it in the cheek and in the face; the head grows heavy, and light is avoided—and sound distresses; the voice is altered in a peculiar degree, and in a manner similar to that produced by frequent sneezing. These sufferings increase as the day advances, until they attain an intensity indescribable and unendurable; reaching their acme at noon, or an hour or two after it, they subside gradually—it may be, pass off altogether, and the evening and night are spent pleasantly and in comfort. This paroxysm, which follows the quotidian interval, is by no means properly a febrile one, for the pulse is often little, if at all excited; there is no heat of skin—no gastric uneasiness. Yet the local affection is clearly inflammatory, for when it comes on in the morning, the face is apt to flush, the eye grows red and watery, and the nostril discharges often a considerable amount of purulent or sero-purulent matter, dripping slowly at first, increasing in quantity with the severity of the pain, and ceasing when that is relieved. From this, its course, the vulgar among us, and especially our negroes, designate it by the title of “sun head ache.” It shows, clearly, I think, in its periodicity, a tendency to observe the septenary as well as the diurnal revolution: of the cases which afforded, under my care, the best opportunity of observation, one terminated after seven paroxysms, one after fourteen, and one after twenty-eight.

I have found it singularly difficult to contend with. In one instance, it seemed to yield to large doses (3 grs.) of quinine, aided by piperine administered a short time previous to its known hour of access. In others, this plan has failed entirely; and I have known it bid utter defiance to the lancet, cups and

leeches applied to the temple, forehead and back of the neck, purgatives, emetics, mercury carried to ptyalism, arsenic, opium, and epispastics. Hot fomentations in which the head and face have been as completely enveloped as possible, and the milder diaphoretics, have seemed to palliate it in some measure, yet not satisfactorily. I have been surprised, that so grievous a malady should have attracted so little the notice of the profession, few of whom speak of it at all.

It is proper to add some brief observations upon the management of catarrhal fever, as it occurs among young children and infants. In these, the derangement of the mucous membrane of the alimentary canal often becomes of paramount importance, and our attention must be more unremittingly and peculiarly directed to the condition of the abdominal viscera, though we are by no means to lose sight of the respiratory disorder. From the earliest stages of such attacks, it is necessary to have resource to some one of those cathartic formulæ with which we can best keep up a gentle and continued action upon the bowels. Combinations of rhubarb with the carb: and sulph: magnesia, and with the carb: potassæ, adding some aromatic to prevent griping, are in very general use. If there be diarrhœa and dysentery, both which complications may present themselves, some anodyne and astringent formula will be required, as the cretaceous mixture with tinct: kino and elix: paregoric, or the acet: of lead with acet: morph: in small doses, cautiously adapted to the age and condition of the subject. If there be determination to the head, and convulsions threaten, the hair should be cut close, and cold affusion applied, while the extremities are warmed and reddened by the hot bath or sinapisms. Dyspnœa, with urgent cough, especially if the harsh, ringing sound, premonitory of, and attendant upon croup, make itself heard, will demand a quick and active emetic, and immersion in the warm bath; and these remedies may be required to be repeated many times during the progress of the case, by the return of the symptoms. Indeed, they are both of them more generally applicable in the treatment of our infant patients, than the above directions would imply. An occasional emetic of ipecac: or the sulph: cupri, will disgorge the lungs of the thick mucus which the child knows not how to spit up; and the warm bath, which might, perhaps,

be advantageously employed in the general management of catarrhal affections, must not be neglected in the very young. In these, it is our best means of equalizing the irregularly diffused excitement, determining to the skin and relaxing its vessels; it diminishes the tickling in the larynx and trachea, and subdues the disposition to cough; puts a stop at once to nausea and retching and abdominal pains; and often relieves happily, by an indirect anodyne influence, the general uneasiness and suffering, procuring, or aiding strongly to procure a calm and tranquil sleep.

The cough is best controlled by the combination of some anti-spasmodic and alkali with small doses of anodyne. Indeed, it is well to introduce into all our formulæ some one or other of the alkalies, for the purpose of neutralizing the acid, which is, for the most part, so predominant a quality of the secretions of the gastro-intestinal surface. I employ the factitious musk (ol: succini with acid: nitric) with the carbonate of potass and the tinct: camph: opii. I need not say, that the convalescent child should be warmly clad, and be protected from all undue exposures.

You are not likely to meet often, in this country, with the typhoid variety of catarrhal fever, so familiarly referred to in the writings of our European brethren; but occasional instances will very probably occur to you, in which, from some peculiarity of constitution, or protraction of exposure, debility may form a prominent feature. In particular localities, and in certain seasons of epidemic prevalence, as in Paris during the recent and severe influenzas to which the French have applied the new title of *la grippe*, this seems to have happened with special frequency.

In exquisite cases of this sort, you will find it necessary to commence the treatment with the liberal use of stimulant diaphoretics. The pulse is low, quick, and feeble; the respiration hurried and embarrassed; depletion, in all the ordinary modes, is absolutely forbidden.

The volatile alkali is here of admirable utility, and must be prescribed in full doses; camphor, nitrous æther, wine and ardent spirits must be freely used, and opium must not be neglected. The surface must be excited in the mean time by hot

applications—fomentations, poultices, stimulating frictions with mustard and turpentine, and ammoniated embrocations and liniments. Epispastics may be directed at such intervals as to keep up by succession a constant irritation from them.

If the pulse rise, and the usual inflammatory affections become gradually developed, you are to subtract from the energy of your stimulant course, and perhaps resort, with caution, to some moderate anti-phlogistic measure. Of these, the best and safest will be the combination of a laxative or mild purgative with the diaphoretic ; and the mercurial, perhaps, deserves a preference—if slow, it may be aided by enemata.

In all catarrhal attacks, the chamber of the sick must be kept at a regulated and uniform temperature—in winter, about 60 of Fahrenheit, while, at the same time, it is to be well aired. The best means of procuring this thorough ventilation is, during cold weather, by lighting up in the chimney a constant, but moderate fire ; in summer, by throwing open doors and windows, carefully placing the bed, however, so that there shall be no current or draught of air directly upon or across his body.

And here I take the opportunity of deprecating the use of bed curtains, which custom has rendered an almost indispensable luxury of civilized and refined life. It will be to little purpose that your patient shall occupy the loftiest, most airy and agreeable apartment, if, by the curtains drawn closely about his bed, he confines himself within a box of a few feet square ; and shutting himself up from the free ventilation going on around him, he is content to breathe again and again air already subjected to the action of his lungs, and loaded with the offensive and morbid exhalations from the diseased cutaneous surface.

CHAPTER IX.

TYPHUS AND TYPHOID FEVERS.

ONE of the earliest distinctions observed with regard to fever, was founded on the obvious fact, that while certain forms of this Protean affection exhibited very prominently the familiar signs of vehement vascular excitement, others, scarcely less frequent of occurrence, showed more particularly the marks of deficient energy of action, and of nervous disturbance. The former were noticed to be attended by inflammatory or quasi-inflammatory determination to various organs, while the latter presented, as chief symptoms, the prostration of vital power, and a characteristic tendency to vitiation of the fluids of the body.

These opposite or contrasted febrile conditions, as they were supposed to be, were designated by appropriate titles. Synocha, among British writers, from Cullen down to Good, and even in our own day, is the term used to denote a purely inflammatory fever, such as we may suppose the ancients to have meant when they speak of the *Causus*, *febris ardens*. Typhus, a word which bears allusion, either to the stupor which so often supervenes in the progress of the cases to which it is applied, or the prostration into which the patient is so promptly struck down—typhus is employed to point out a fever of which muscular debility, nervous derangement, and an assumed putrescency of the fluids, are peculiar and essential coincidents. But as Nature seldom rests in extremes, or preserves marked lines of separation between allied forms of disease, the nosologist soon felt the necessity of instituting, in order to preserve any consistency with the observed facts, a third class, of mixed fevers, in which first the one, and afterwards the other, of these sets of symptoms predominate. This compound of the two varieties first spoken of, they choose to denominate Synochus. You will readily infer, from the pathological opinions which I announced when treating of the general topic of fever, that I cannot coincide in the propriety of such an arrangement. It follows, necessarily, as a deduction from the premises then laid down, that all fevers are

of this mixed or synochus character. Indeed, the difficulty which the writers above alluded to, seem to have met with in drawing, upon their own principles, the lines of distinction between the three proposed types, must strike every careful reader as impugning the accuracy of their views. Thus, while Cullen considers synochus as scarcely separable from typhus, on the one hand, Good, on the other, almost merges it in cauma or synocha.

You will recollect, that the coincidence of vascular and sensorial derangement was maintained to be universally characteristic of fever in all its varieties. I am ready to acknowledge, that we do not clearly know the nature of the morbid action in either of these systems. I am, as I have said, inclined to the belief, that the sensorial energies are, from the very nature of the case, depressed or diminished in febrile attacks; yet it would not be difficult to produce examples in which an opposite condition was apparent, to say the least. Nor am I disposed to recognize any fever as correctly inflammatory in the precise sense of the word, although I may occasionally use the phrase in compliance with custom. I do not regard inflammation, properly so called, as by any means an essential element in the history or description of any form of idiopathic fever. I readily admit, that inflammations frequently present themselves as concomitants or consequences of many varieties of fever. They are, doubtless, easily recognized as the efficient causes of irritative or symptomatic fever.

It is a very interesting and obscure question, Whence this difference of forms in fever? No satisfactory solution has yet been, or can be given. It probably depends upon many concurring circumstances, which require a separate consideration. The first, and perhaps the most effective, may be found in the condition of the subject—his predisposition, as we usually call it. For example, any of the causes formerly specified of debility, direct or from abstraction of normal or accustomed stimuli, when their application has been long protracted, will produce a state of the system implying a degree of prostration of vital power; a condition of body obviously favorable to irritation or other derangement of the nervous function. Many of these circumstances lead clearly, too, as we shall see, to the probability of a coinci-

dent vitiation of all the fluids or humors of the body. Let an individual thus prepared to become sick, be subjected to the influence of any of the occasional or exciting causes of fever, and the result will almost, of course, be an attack characterized by the low species of morbid action, irregular excitement and defective power, whose combination constitutes and distinguishes typhus from other modes of fever. Thus, we find it following upon tedious exposure to cold, long continued fatigue, protracted care and anxiety and any depressing mental exertion; upon scanty alimentation, or bad, improper, innutritious diet. The hungry peasantry of Ireland, the miserable free blacks in the Northern cities of our confederacy, and the wretched class of paupers every where, offer abundant verification of these remarks.

In this list of directly debilitating influences, strongly calculated, too, as I have already said, to give rise to a vitiated condition of the blood and all the secretions and depositions from it, deprivation of fresh and respirable air must be accounted one of the chief. The contaminated wards of ill-ventilated hospitals; the crowded decks of vessels of war and prison ships, and the foul, mephitic atmosphere of the dreary jail and the dank dungeon, have been long noted among the prominent sources of this pestilence, hence designated familiarly "jail" and "hospital fever." It is perennially domiciliated in the narrow, dark and damp lanes of the comparatively well-fed city of London, as well as in the desolate streets of starving Cork or Dublin. We can trace it occasionally to the filthy state of the huts of the slaves on our plantations; whence is derived the excellent system followed by some planters, of building for them new negro houses in new locations every few years, or whenever they are observed to become affected with low grades of fever, or otherwise sickly.

Under this head, too, it is proper to notice the conversion of other forms of fever by mere protraction, and their assumption of typhoid characteristics. This is common enough among us to have attracted universal observation, and to have become matter of familiar reference. I have seen it supervene in tedious cases of catarrhal, remittent and yellow fevers. Nay, such conversion is affirmed by Ferguson, to have occurred in a ship

at sea from crowding between decks in bad weather. Yellow fever at first, it became "as truly typhus as any he ever saw," resuming its original type when the vessel reached her harbor. Here we attribute the peculiar effects to the predisposition generated in the subjects of attack, nothing having been changed but the condition of the individuals affected.

Peculiar idiosyncrasies are asserted to exist in families, in tribes, and in the various races of men, which determine in them a special liability to the attack of typhoid fevers. I do not doubt the truth of this assumption as to the black race, who are ready, on all occasions, to become the subjects of these low forms of febrile disease.

The nature of the efficient cause also goes far to develop the various types of fever. We do not hesitate to ascribe all that is characteristic in our bilious remittents and intermittents, to the specific agent producing it. In regard to yellow fever, our speculations are clouded with some uncertainty; but I have not shrunk from a similar inference. The geographical limits which it so steadily observes, as to its indigenous or endemic production, and the mode in which it spreads—and the respect which it so generally shows for local acclimation, (including its own previous impression on the system) all justify this conclusion.

By a large majority of pathologists, at the present time, a specific contagion is affirmed to belong most obviously to what they call true typhus, as distinguished from typhoid fever, a (distinction to be spoken of more in detail by and bye,) and to form the most effectual among the means by which it is propagated and characterized. This doctrine, though not entirely uncontroverted, is susceptible of ample proof, and I have become abundantly satisfied of its truth, as well from facts occurring under my own observation, as from the weighty authorities which support it. To the peculiarity of influence of this specific matter of contagion, has been attributed, and especially in the more malignant grades of this variety of continued fever, the whole train of successive results consequent upon its efficient application; a solution not altogether devoid of plausibility, and one which cuts asunder a knot that would not perhaps be easy to untie. But, notwithstanding this assumed power of self propagation, in which I most fully believe, it is not to be doubted that

a certain favoring condition of atmosphere, known from the days of Sydenham, as its epidemic constitution, must at times exist, in order to account for its more ready extension and wider and more violent prevalence. The definite nature or character of this ærial predisposition favorable both to the generation and propagation of typhus—is not known; it is probably the product of many concurring elementary agencies.

It will be observed that I treat of typhus and typhoid fever under the same general head. I am satisfied of the identity of all the modifications of continued fever, collected by writers under these names, and am persuaded that the more closely the subject is examined, the more this opinion is destined to prevail. Let me not be thought for a moment, however, to undervalue the labors of those who, in Europe or in our own country, have sought to draw definite lines of distinction, and to mark clearly the diagnosis between what they have called true typhus, and the typhoid fevers which so closely resemble it. The very effort has been of great advantage to the profession; and the result of all the discussion is, that no disease has been so thoroughly examined as to its history—symptoms, pathology, and the therapeutic management proper to be followed.

In ordinary practice, the ancient familiar division referring to mere violence or intensity, may still be conveniently retained, and we may speak without any impropriety of typhus mitior and typhus gravior. The first, known in common language as “nervous fever,” is slow in its progress and mild in its symptoms; not often fatal, and very little alarming in appearance. Such are a great majority of the sporadic cases that occur in our white population and in our genial climate. Typhus gravior—the “putrid fever” of the vulgar—jail, ship, hospital, camp fever, usually attacks numbers at once in a particular locality, or spreads epidemically; it is often rapid in its progress; the changes in the condition of the body, its organs and its fluids, are strongly marked and supposed to be indicative of a putrescent vitiation, whence the above phrase; it is of large proportional mortality, and is truly regarded as a terrible pestilence.

Nor are nice scientific distinctions wanted,—if it be our purpose to separate from each other the various modifications of this class of fevers. Armstrong followed by many physicians, divides

Typhus into three varieties,—the simple, inflammatory and congestive. The first he supposes to consist in morbid excitement, generally diffused and unproductive of any such local determination as shall give rise to inflammation of any part or organ. The second is attended with this local inflammation of one or more organs. And the third is characterized by a loss of balance of the circulation, and a consequent congestion of blood in the nervous system. Now I doubt much whether there ever occurs an unmixed case of “simple typhus,” in Dr. Armstrong’s sense of the word. He himself observes, that he “cannot help suspecting that in almost every fatal instance of simple typhus, there is really a degree of lesion in the structure of some vital organ.” I do not coincide with him in this suspicion. I am rather inclined to believe that in such instances of seeming simple fever—the typhus mitior—nervous fever of the old British authors, death results not from organic lesion, but from congestions, which interfere with the due performance of the vital functions, or give rise to exhausting irritations; the patients sinking with coma or diarrhœa, or ultimately in long protracted attacks, with atrophy. The difference dwelt on by Armstrong between inflammatory and congestive cases is obvious, and practically useful; but it is only such as is shown in all fevers, and is familiar to every practitioner. Some patients are assailed with the tokens of open and vehement vascular excitement, the skin being hot, the pulse full and the face flushed; while others exhibit an equally marked prostration of the sensorial and circulatory energies, as shown by a pale or bronzed surface, cold extremities, great muscular weakness, with coma or muttering delirium. But inflammation and congestion are not coincidents of fever exclusively; they may present themselves as parts of the history of almost all diseases, whether pyretic or not, as in cholera, for example, and epilepsy. Hence they cannot be made the bases of definite types of fever.

Piedagnel, a recent French writer, to whose therapeutical remarks I shall by and bye take occasion to refer, distinguishes four varieties of typhus. 1. Simple, corresponding with Armstrong’s. 2. Adynamic typhus, in which abdominal affections are prominent, with ultimate ulceration of the intestinal mucous membrane, and extreme prostration. 3. Ataxic typhus, in which

the cerebral symptoms predominate, with pain in the head, early delirium, perversion of the senses, coma, subsultus, etc. 4. Putrid typhus, a rapid and malignant form, in which the patient dies without any organic lesion, as far as has been revealed by autopsies.

Those who are anxious to establish an original or primary type, which shall be recognized as true typhus, and to which the typhoid varieties shall be referred for comparison, have been unable to agree upon a uniform description of this type. Some propose the pestilential typhus of armies, typhus castrensis, as the model: some require contagion as an essential element in its history: some regard it as truly one of the exanthemata, and pourtray for us its characteristic eruption: some designate it as uniformly accompanied by intestinal lesions of specific nature and appearance. We shall find, as we proceed, that all the symptoms which have been offered by one or another as diagnostic, have occurred promiscuously in each of the several varieties, by whatever title designated. I will first attempt to describe the course of typhus, and then dwell for a moment upon the signs of functional disorder attendant upon its progress, and the organic lesions discovered after its termination. We shall thus perceive most clearly, how readily all the modifications of continued fever run into and mingle with each other, forming a series inseparably connected together.

Typhus Mitior, for I shall delineate first the milder grade of the disease, the "nervous fever" of some English writers, the "simple typhus" of Armstrong and Piedagnel, is usually of sporadic occurrence, and steals upon the patient with slow and gradual approaches. He first notices his loss of appetite, with an unpleasant taste in the mouth and a tongue slightly furred. He complains of languor and feebleness, is occasionally chilly, is low spirited and shrinks from any effort either of mind or body. At times there is nausea, with more or less oppression at the precordia, sighing and mental anxiety. The skin becomes hot and dry, and eruptions of various appearance may or may not show themselves upon it. The pulse is contracted in volume and incapable of bearing much pressure with the finger. It is frequent, ranging in the majority of cases from ninety to one hundred and twenty, varying a little at different periods of the day,

being more hurried and perhaps somewhat more tense between sunset and midnight, and softer, perhaps rather slower between sunrise and midday. But this imperfect exacerbation and remission which may also show themselves by other slight differences, as in the temperature of the surface and the urgency of the thirst, are not uniformly observable, nor by any means regular or calculable. The head is variously disordered; most complain of headache with vertigo increased on motion or rising from the recumbent posture, and a throbbing of the temples; it is not uncommon that a light and quiet delirium supervenes early, with muttering or incoherent talking, from which the patient may be roused by speaking sharply to him, or calling his attention loudly. The eyes are moist and brilliant, and intolerant of light, the countenance sallow or darkly flushed. The tongue is furred and red, and the thirst intense; the bowels, in the beginning costive and torpid, so as to be moved with difficulty, becoming irritable and loose, with dark colored offensive evacuations. From the tenth or eleventh to the fourteenth day and so onward, the muscular debility increases, with disposition to syncope on moving or rising; tremors and subsultus tendinum supervene; the tongue throws off its fur, presenting a smooth, red, shining surface, often dry and chapped, occasionally apthous and sometimes covered with a black tenacious sordes, with which the teeth and lips are smeared, and which is said in many instances to have been traced into the air tubes and cells of the lungs. The abdomen is swollen and tense, and tympanitic; the pulse is very rapid, undulatory, or perhaps intermittent; if any intellect remain, there is great despondency and distress; generally, however, all sensibility to suffering subsides and the patient, if he speaks at all, will tell you he "is well," or as is not unusual, a sullen indifference to every thing around him is exhibited, with picking the bed clothes or catching slowly at imaginary objects in the air. Coma very often precedes death.

It is rare in this variety of fever, that any change occurs so marked or striking as to claim much attention, or to deserve to be regarded as a crisis; the fatal termination in bad cases, approaches with a steady and gradual aggravation of the symptoms above recounted; and on the other hand, convalescence is reached by a gently progressive mitigation of the patient's suf-

ferings. The general prognosis is, on the whole, favorable, the proportional mortality being greatest in subjects past the middle age.

Typhus Gravior, including as I do, under this head, all the severer varieties of typhus and typhoid fevers, the adynamic, putrid, and ataxic forms, is happily not often met with in these warm regions of free air and abundant food. It almost always presents itself as an epidemic, affecting numbers at once, either from some local peculiarity of circumstances common to the mass, or from some spreading contamination of the atmosphere. It is rapid in its progress, presenting a large proportional mortality, and advances so often with unchecked march to its fatal termination, that a few practitioners, Smith and Bigelow among them, have deemed it to be above all the resources of our divine art. Far from us, however, be this craven doubt. Our science has saved and is yet destined to save thousands and thousands still from the grasp, even of this pestilential destroyer; and he is unfit to enter our ranks, who is not prepared to trust with confident hope in the unlimited and illimitable extension of its future usefulness.

Typhus Gravior commences usually with a rigor or alternation of chill and flushing, succeeded after a time, by a pungently hot, harsh, dry skin; there is oppression at the precordia, with occasional nausea and vomiting; the mind is disturbed and dejected, the countenance expressive of deep gloom and anxiety, the face flushed darkly and turgid, or of a livid paleness, the eyes are red, the lids hanging heavily as if to shut out the light. The pulse is small, frequent and irregular, at first somewhat tense and chorded, but soon losing its force and becoming compressible; the tongue at first thickly coated with a yellowish or brownish fur, swollen and indented around its edges by the teeth, either assumes a fiery red hue with apthous ulcers all over it, or grows dry, and smooth, and brownish on the surface, cracking or chapping, and incrustated like the teeth and gums—with a dark sordes. This black sordes, which presents itself occasionally in protracted cases of all forms of fever, is not well understood—nor easily accounted for. It is a mistake to ascribe it, as Chomel does, to the mere drying of mucus on the surfaces affected, for this does not explain its color, nor does it appear

always when the dryness is greatest. I regard it as somewhat analogous to "black vomit," perhaps consisting of minute portions of the coloring matter of the blood mingled with scanty and morbid secretions from the parts. He considers it proved to be "spontaneous," that is, independent of all treatment, and belonging to the progressive history of the disease. The bowels are affected very variously in different cases, and in the epidemics of different seasons. On some occasions, we meet with obstinate constipation or sullen torpidity of the alvine canal, requiring powerful cathartics to be frequently administered. At other times, the intestines are highly excitable and irritable, and the patient is annoyed by a teasing and exhausting diarrhœa. A tympanitic distention, meteorism, with or without pain, is not unfrequent, and is apt to be attended with hiccup. Meteorism may be of two kinds, and imply the existence of two different conditions. The first is mere flatulence, occasioned by the evolution of air within the intestines; in a protracted case it is a bad symptom, as showing a loss of tone, and if painless, a loss of sensibility too, in the bowels, which do not expel it. It threatens also, the terrible risk of perforation of the softened and ulcerated tissues, which yield to its distending force. The second, whose existence some deny, depends upon the effusion of air within the peritoneum. I am satisfied that I have often met with it. Its presence is clearly to be inferred when the alvine movements go on, with free expulsion of feces and air, the distention continuing unabated.

The prostration of muscular strength, striking from the first, proceeds rapidly; the patient sinks to the most depending part of the bed, with tremors, and subsultus tendinum, and syncope on moving. Subsultus is generally ascribed to mere debility, but this seems to me an error. It is obviously analogous to paralysis agitans, and implies nervous or sensorial irritation in notable degree. He lies heavily stationary, and if the case is of long duration, sloughing of the parts pressed on is apt to take place. The breath is fœtid, the respiration hurried and embarrassed, or if coma supervene, it is slow and stertorous with sighing and sobbing. Petechial spots or vibices of a deep red, or even a purplish hue mottle the skin. The alvine evacuations are abominably offensive, and pass involuntarily. In the last

stages we have frequently hemorrhage of a black and dissolved blood, from the vessels of the nose or mouth, the stomach, or the intestines. Convulsions happen, though more rarely than coma, which, in a majority of cases, precedes death by a short interval. Coma is defined in the books as of two modes. Coma vigil, in which the patient lies with his eyes open, and though stupid and inattentive, gives occasional evidence that he is not asleep; coma somnolens, which resembles the heavy soporose sleep of the apoplectic, being attended with stertor and moaning, and the eyes for the most part shut. The two conditions appear to me to stand somewhat in the same relation to each other as true sleep to somnambulism. The period of termination varies with all the contingencies which affect the progress of the case from the fifth to the twenty-fifth day, or even later.

Perforation of the intestinal tunics, one of the modes of death in typhus, is scarcely to be known with certainty except on post mortem examination. It usually happens very suddenly, and, as is remarked, when the patient seems convalescent. Such has been the fact in two cases under my own notice, both of which were so far advanced in apparent recovery, that they were sitting up and able to move about. We infer that it has happened, from the acuteness of the abdominal pain and the rapid tympanitis which comes on, generally accompanied with vehement vomitings and tenesmus. I have seen no recovery after perforation, and doubt the possibility of such a favorable event.

There are many circumstances in the history of the more pestilential forms of typhus, which seem to give a degree of plausibility, if not absolute confirmation, to the received notions of an essentially putrescent tendency in the fluids of the infected body. The petechial spots upon the surface—the hemorrhages issuing from every opening—the prompt disposition to gangrene of all pressed and inflamed parts—the black and dissolved state of the blood, and the cadaverous smell given out from the patient's body, have, from the earliest times, been assumed to evince a characteristic and peculiar proclivity to disorganization both of the solids and of the circulating mass. I am aware, that it has become fashionable, and especially in the schools of this country, to stigmatize all such statements and opinions as relics of what they style the doctrine of obsolete humoralism. Truth,

however, cannot become obsolete, and it is easy to establish the correctness of the positions of the older writers on this subject, while we admit the necessity of modifying the language which they employed. "In modern times," says Armstrong, "we have been far too much disposed to ridicule the humoral pathology ; but the truth is, that all specific fevers may be considered as humoral diseases, so signally are the fluids affected. If the advancing state of knowledge has revealed to us the incorrectness of the phraseology and reasoning of former physicians on this point, yet we are not thereby authorized surely to despise their communicated facts. Who can peruse the admirable writings of Sydenham without being satisfied that the fluids did undergo vitiation in the fevers which he has described ? and who can, at this day, watch the progress of typhus at the bedside, and fail to be convinced that they still undergo similar changes?" Professor Potter, of Baltimore, affirms that an altered condition of the blood uniformly preceded, in his observations, all the other symptoms of yellow fever ; and Chomel and Stevens, however widely they differ on other points in the pathology of fever, agree that "vitiation of the blood" is one of its essential, earliest, and probably incipient elements. Chomel describes the changes of the blood in thirty cases, bled at different times. In eight of them, it was buffy, but the crust did not resemble that of the acute phlegmasiæ. In four, it was "diffluent," or "gory," or "dissolved."

It is unnecessary to urge objections against the use of the ancient terms fermentation and putrefaction as applied in their ordinary and chemical sense. It is clear that they cannot, thus employed, properly denote the conditions of the animal fluids in a living state, however depraved and morbid they may be. We resort to them now, merely to point out those alterations which imply the greatest defects of vitalization—such as approximate most nearly to the changes they are to undergo when entirely deprived of life. The tendency to decomposition of the animal tissues and fluids, is only resisted by the force of the vital laws ; but in typhus, more perhaps than any other malady, is this influence of vitality impaired and overcome ; the nervous energy—the power of assimilation and of defecation—the only *vis medicatrix* of the constitution—the true protective and preservative function, is long before death notably weakened, indeed nearly

extinguished by the agency of the efficient morbid cause to which we ascribe the disease. There is no want of facts which go to prove, beyond any reasonable doubt, such a tendency, both in the solids and fluids of the body in typhoid fevers. Some of these were referred to in my brief notice of the humoral pathology, in a former lecture; you will find a considerable collection in Dyckman's learned treatise on this subject, a treatise well worthy your perusal.

The general Prognosis in the severer grades of typhus, is very doubtful, and the proportional mortality at all times great. The symptoms are favorable or the reverse, as they betoken an increase or diminution of sensorial disturbance, and more or less impairment of the vascular energies. Stupor or insensibility to external impressions, the failure of irritants to act on the surface, stagnation of the capillary circulation, whether pulmonary or cuticular, hemorrhagic discharges, petechial spots on the skin, vibices, gangrene of pressed and inflamed parts, peculiar fœtor of the breath, the emission of a cadaverous odor from the body; these are signs of an extremely grave and dangerous condition of the patient. On the other hand, an awakening attention to surrounding objects, annoyance from blisters and other counter irritants, and other marks of returning mental and physical susceptibility, are hopeful indications. Among the favorable symptoms, authors generally mention deafness; but this I have not observed, nor do I profess to understand the rationale of the matter.

The duration of typhus or typhoid fever is exceedingly uncertain. Few or no cases end earlier than in the second week, while it has been known to be protracted to thirty, sixty, and even ninety days. Bigelow regards it as "self-limiting," meaning that it is not susceptible of limitation by interference or treatment, but that it runs its own special course. This is not exactly true in any sense. It is not, like small pox or measles, obstinate in coming to an end at a definite period, nor is it, like them, incapable of being cut short. In both these respects it is indefinite, being sometimes "jugulated," as the French phrase is, often palliated in violence and abbreviated in its course, by attention, good management, and other favorable contingencies; and frequently aggravated and protracted by injudicious treatment and surrounding evil influences, such as bad air and want

of cleanliness. Chomel notices improvement to have commenced notably, in one case on the eighth day, in one on the forty-fifth, in the greatest number from the seventeenth to the twenty-fifth, inclusive.

Autopsy. In some bodies dead of typhus of either grade, no traces are found of lesion, sufficiently marked to attract notice. These have been dwelt on as examples of simple typhus. In a very large proportion of cases, however, there are well defined alterations of structure. The brain and its membranes are often deeply injected. Arachnitis is said to be especially frequent; effusions of various character occur, serous or purulent, within the ventricles or upon the surface; there is occasional softening of some portion of the cerebral tissue, particularly at the base of the brain. The lungs are sometimes engorged and consolidated, the bronchial membrane not seldom thickened and painted over with the dark tenacious sordes found on the teeth and gums, etc. The digestive mucous membrane is also commonly the seat of lesion, presenting a variety of changes from mere redness to softening, ulceration more or less extensive, and erosion. Perforation of the intestinal tunics may take place, as I have already stated. In one of the cases which I met with, an immediate inflammation of the peritoneum supervened, with intensely painful distention of the abdomen, the patient dying in a few hours. On examination, I found several small portions of the pulp of an orange in the peritoneal cavity; they had passed thither through an ulcer of nearly one third of an inch in diameter with ragged edges, situated near the lower end of the ileum. In the other, the coats of a large vein were eroded in the colon, and the patient sunk under intestinal hemorrhage.

This perforation of the intestinal walls occurred to Louis eight times in fifty-five cases dying of typhoid fevers—one in seven; to Chomel, once in twenty-one cases. He (Chomel,) calculates the average as one in ten cases—greatly too high a ratio for our experience in this country. He saw a perforating ulcer in the colon, at its union with the ileum. He is disposed to attribute perforation always to gaseous distention, which tears or lacerates. This follicular ulceration of the intestines which has attracted so much notice, is most commonly found in the ileum, beginning in the agminated follicles near the ileo-cæcal valve. It

most frequently attacks the glands of Peyer—less so the insulated follicles. I have seen these ulcers in the colon. They are usually elliptic or circular, and vary in size from one twelfth to half an inch in diameter. The erosion is, generally confined to the mucous membrane—some times destroys both the cellular and muscular tissues; it appears to be the common belief that it spares the serous tunic or peritoneum, which may be disrupted or torn by distention. Chomel has seen cicatrization of these ulcers in various stages, even in bodies dead of typhoid fevers.

We are now prepared for a brief discussion of the so much agitated question as to the diagnosis of typhus and typhoid fevers. Do these differ essentially from each other, and what are the characteristics of each?

Under the name typhus, Cullen includes nearly all the continued fevers of Great Britain, denoting certain modifications by the use of the phrase synochus, synochoid typhus and typhoid synochus. Similar views appear to be entertained by British pathologists generally, through Good, Armstrong, W. Philip, etc., down to Tweedie and Craigie. The majority of them tacitly, Clutterbuck and Southwood Smith formally, refer the modifications to mere intensity. Among the French, Bretonneau observed a peculiar affection of the intestines to be a common symptom in the continued fever of the continent, and thence applied to it the denomination of *Dothin-enterite* or *Dothin-enteritis*. His observations were repeated and confirmed by Petit, Cruveilhier, Andral, Chomel and Louis; but none of their remarks decide this controversy. Bally regards fever with this complication as an *ileo-colitis*; Petit and Serres entitle it *enteromesenteric fever*; Andral looks on it as an intestinal exanthem, and places it among his *ataxo-dynamic fevers*. This last writer objects to the phrase *typhoid fever* or *typhoid affection*, first used by Louis and Chomel, as not significant; it does not appear that they intended it as a definite or specific appellation, though it has been made so by Gerhard and others.

Whatever may be said of the importance of the distinction contended for, we cannot but be struck with the want of uniformity, nay, the remarkable discrepancies in the views of those who admit it. The very terms employed seem to have been used promiscuously to designate the various conditions and

forms of disease spoken of. Such of the European writers as have aimed recently at a nice diagnosis, have at least, with etymological propriety, attempted, in the first place, to define and pourtray true typhus as the standard, and next, under the general head of typhoid, to describe to us the several variations from the supposed model.

In this country the opposite method seems likely to prevail. Dr. Gerhard selects for the standard, on account, I suppose, of the precision to be obtained by a reference to well detailed anatomical changes—the dothin-enterite of Bretonneau, to which he affixes the term used by Louis and Chomel—"typhoid fever." This he regards as synonymous, or nearly so, with Cullen's typhus mitior. Low fevers not attended with follicular ulceration, he calls typhus—typhus gravior. He lays little stress upon the difference of intensity; nay, he tells us that the epidemic contagious typhus was, in his hands, no more mortal than the French typhoid.

I am confident that enough has been recited to you, from various sources, to convince you of the absolute insufficiency of this anatomico-pathological diagnosis. Let us recapitulate briefly. On the subject of these "distinctive and characteristic lesions," I refer—to Armstrong, who recognizes "a simple typhus without any lesion—to Andral, who makes "a (third) class of ataxo dynamic fevers, in which no lesion of the digestive tube exists"—to Lombard, who states the following facts: "In Paris and Geneva he found follicular ulceration an essential and uniform element in the fevers met there; in Glasgow, in similar fevers it was not uniform; he failed to find it in the first he examined, and was told that it occurred in about one third: in Dublin he failed to find it, and was told that it occurred in less than one third, and in Liverpool it was much the same: in Birmingham, again as at Paris and Geneva, it was uniform: it was not uniform in Manchester—to Tweedie, who says, that "in London it is not met with in more than one fourth, varying with the seasons, and most frequent in autumn"—to Alison, who says, that "follicular disease is not always present in typhoid fever"—and lastly, to Gerhard himself, who acknowledges to have met with six cases of true typhus, in which the intestinal lesion resembled dothin-enterite, and admits that the follicular ulceration

occurs in the British epidemic, which he regards as true typhus, but says "that it is merely accidental—a complication not in the ordinary course of the disease." But this accidental occurrence of a diagnostic symptom—how illogical the phrase!—is by no means rare. I have quoted Lombard as affirming that it was uniform in Birmingham; in Manchester it was not so. Do the fevers of these two cities differ essentially? In Edinburgh, Dublin, Glasgow and London, it is not uniform; it shows itself in a proportion of the cases, differing at different times. Of fifty-four cases spoken of by Tweedie, in 1828-29, it occurred in sixteen, more than one fourth. Of five hundred and twenty-one cases in the Fever Hospital, it was met with in but forty-four—about one in twelve. I regard this uncertainty as perfectly conclusive; unless it can be shown (which has not been even attempted,) that the cases were mixed, some of them being true typhus, and others definitely dothin-enterite or typhoid.

But this intestinal lesion is not the only diagnostic proposed. True typhus is by some looked upon as an eruptive fever—one of the exanthemata; as contagious; as attacking but once; and these properties being denied to the class of typhoid fevers in all their variety, we have thus a line of demarcation offered to separate them. I shall not again enter into the discussion as to the contagiousness of these forms of fever; enough has been said on the subject, to establish the doctrine in regard to all the modifications which present themselves: and besides, the testimony offered is not by any means controversial or distinctive, and does not allow of being applied to any one variety exclusive of any other. The eruptions which appear in typhus fever are three. Is any one of them uniform and characteristic? I answer no. It is singular that the best description we have of these appearances, affirmed by Hall, Copeland, Perry and Gerhard to be diagnostic of true typhus, should come from Chomel, when writing of typhoid affections in the widest sense of the term.

The 1st, a rose colored eruption—a "roseolous rash" consists of minute rose red spots disappearing on pressure; from one-half line to two lines in diameter, circular, scarcely elevated. Louis never saw it before the sixth day; most come out between the eighth and the fifteenth. It is far from being constant. Chomel says it is wanting in one-fourth of the cases; with us it will not

be seen as often, perhaps, because so large a portion of our patients are blacks.

2d. Another eruptive affection in these fevers is known by the appellation *sudamina*. These are described (by Sennert and Chomel) as consisting of small hemispherical vesicles one-quarter to one-half a line in diameter, with a brilliant surface, if viewed obliquely, but imperceptible when sought in a direction perpendicular to their axis." I have found them readily by the touch. They contain a transparent serous fluid, which exudes if they are lacerated. They are found usually on the sides of the neck and near the groins and armpits; they may extend over the body, but seldom or never on the face. They appear at the close of the second septenary period, later than the rose eruption. So far from their being diagnostic, I have met with them even in protracted attacks of intermittents and remittents.

3d. *Petechiæ*—which has given name to many varieties of fever of low type, are by no means peculiar. Pressure does not make these spots disappear, because they imply a minute extravasation of blood at the surface of the chorion. Chomel affirms the petechial spots of his typhoid fevers to have been quite similar to those of typhus *castrensis*. They look like punctures, or the bites of an insect.

Nothing can be more groundless than the notion suggested by some of drawing distinctions between the modifications of typhus fevers from their proportional mortality. This varies in every form with contingencies so numerous as not to be easily designated. It would seem natural and reasonable to expect that the organic changes which have been set down as diagnostic of typhoid fever, dothin-enterite, the intestinal ulcerations namely—should give this special type a special mortality. We are distinctly informed however by Gerhard himself that such is not the fact; and the ratio of deaths in all the tabular statements in our hands is obviously influenced rather by local conditions, those of season, etc., than by this consideration of type even when most clearly made out. For myself, however, I will remark, that as to the particular prognosis in each individual case, whatever its form or denomination, I should entertain a worse opinion of the prospects of my patient, if I believed this follicular ulceration to have occurred. It is apt with us to show itself

by diarrhœa, colicky pain, distention of the abdomen or meteorism, with a tongue swollen and sore—the salivary glands being excited and enlarged. This complication which has been for years increasing in proportional frequency among us, always portends great risk.

Of the Pathology of typhus, little remains to be said. A peculiar affection of the brain is fairly to be inferred—even more from the symptoms during life than from the appearances after death. These latter, which vary notably in relation to the period at which death has taken place, and which, as I have often contended, display rather the results or effects of disease than its causes or even its essential conditions, should never be allowed an undue weight in leading us to definite conclusions on these latter points. This is the error of the modern school of “pathological anatomists.” Thus Boisseau tells us that “typhus is sometimes a gastro-cephalitis, an entero-cephalitis, a pneumo-cephalitis, a pleuro-cephalitis, a hepato-cephalitis, and sometimes a primitive encephalitis simple, or complicated with inflammation of the stomach, the intestines, the lungs or the pleura.” From this barbarous heap of words, what idea is to be culled? How are we to extricate ourselves from this confusion of incidental conditions with such as are affirmed or imagined to be uniform and essential? What fever is there which does not leave traces in the dead body of inflammation, cerebral, thoracic, abdominal? Whence the difference then of type in fevers? Whence the difference in the series of phenomena which constitutes the peculiar character and history of every separate type? There is no effect without a cause! Yet the belief in the existence of such a cause here, is stigmatized as essentialism and ontology.

The nature of the cerebral change, which I regard as absolutely indispensable to the development of typhus and typhoid fevers is not clearly definable. It surely is not simple inflammation—for typhus is not phrenitis. Nor can it be merely congestion—for there is very often increased activity and a sort of excitement. This, if not uniform, is of so common occurrence as to have become known by the special designation of typhomania. Inflammation of the brain and its membranes very often ensues in the progress of the cases, but this, like intestinal ulceration, is consequence and result of fevers generally; that they are seen

most frequently in those under discussion, happens, I doubt not from their long protraction and from the striking impairment of the vital powers, whose energies constitute the best defence of the system against every mode of organic change.

Of the Treatment of Typhoid Fevers. In the management of these, more than perhaps of any other forms of fever, will it be necessary to consult, with especial care, all the circumstances of each individual case separately; for, in no malady will these contingencies of age, state of constitution, present situation, comfort, attendance, etc. more decidedly influence our practice. "The art of physic," says Sir George Baker, "rarely admits of any perpetual precepts, and the best remedy may do much harm, if not adapted as well to the patient as to the disease:" a maxim peculiarly applicable to the subject under discussion.

In a very considerable proportion of the sporadic attacks of these continued fevers, by whatever name we may designate them—typhus mitior, simple typhus, typhoid, or synochoid affections, patients of ordinary vigor, and of early or middle life, will recover, under favorable circumstances, with but little aid from medicine. By favorable circumstances, I intend proper nursing, protection from the varied modes of morbid excitement which tend to exasperate the symptoms, and free ventilation; nothing will convert a mild into a grave case more certainly than foul air and want of cleanliness. All that is required from the physician, for the most part, is a proper attention to the bowels and the skin. In general, we shall derive obvious advantage from a resort to the gently purgative course, persisted in for a few days, and modified in its details by a careful observation of its effects. This is the plan of treatment so much dwelt on, if not originally proposed, by Hamilton, and now followed extensively in every part of the world. The assumption, however, that such a course as this could be salutary, or even innocuous, is so absolutely incompatible with the Broussaian notions of fever in general, as mere gastro-enterite, and of this type of fever in particular as a dothin-enterite, that it has been assailed with the utmost vehemence by the followers of that school—the physiological, as they have affectedly styled themselves since their ingenious, but arrogant master, has abated so much of his high pretensions, and lost so much of his ephemeral popu-

larity. The very name of the Scotch professor, and the title of his work, are hateful in their ears. Nay, I have been gravely assured by one of the few unshrinking advocates of that school, in this country, that "since the art of printing was invented, no book was ever issued from the press, so mischievous in its tendency and influence, as Hamilton on Purgatives." Nevertheless, while I readily admit, that the author lays an undue and too exclusive stress upon his favorite remedies, I will venture to recommend the essay to you as full of good sense and sound practice, (with that reservation,) and worthy a place in all your libraries. It is interesting to find, that in the mutations of medical opinion, the practice proposed by Hamilton has been introduced into the French metropolis, and is likely, even there, to supersede the mummery of the medicine expectante, with its modern additions of leeches and gum-water. A paper, since published, was read in 1835, to the academy of medicine at Paris, by M. Piedagnel, whose name has already been mentioned to you. In this document, he gives the result of a series of experiments at the Hotel Dieu, undertaken to procure, on a large scale, numerical records, which should determine the comparative success of this mode of treatment compared with other modes. Observe, that he followed promiscuously and exclusively this purgative plan, without any effort at discrimination or adaptation. The cathartics he employed were castor oil, croton oil, calomel, Seidlitz water, Epsom salts. In simple typhus, out of sixty-nine cases, he lost not one; of adynamic, ten died in thirty-nine; of ataxic, nine in sixteen. In the practice of Chomel and Louis, the deaths are as one to three and a fraction; in that of Piedagnel, as one to seven and a fraction, and even Gerhard boasts of no higher success, after his most scientific and cautious effort at nice distinction and exact appropriation of precise remedial means. An incidental confession from Bigelow and Holmes, is not without its weight here. They state distinctly, while advocating the self-limiting nature of the malady, and the consequent propriety of the expectant method, that "in the reports of the Massachusetts General Hospital, the numerical preponderance of favorable cases is on the side of those in which active remedies were resorted to in the early stage of the attack."

Of course, I recommend to you no mechanical or uniform mode of management ; nor do I doubt that something is to be gained by the choice of purgatives. There are cases in which I prefer, at the first, a mild but efficient emetic, as when the tongue is soft, moist, swollen, with a thick fur, and the fœtor of the breath shows a morbid state of the mucous secretions. The stomach is apt, in such instances, to be uneasy and oppressed, and great relief is obtained by free vomiting. If ipecac: or ant: tart: be employed, or their combination, sufficient action on the bowels will probably follow, and we may proceed at once to administer some diaphoretic, as the spts: mindereri, or infus: rad: serpentariæ vel senekæ, or the mist: alk: et diaph:

The cathartic most generally applicable, is calomel, which should be given in full doses, either alone or combined with rhubarb. If it fail to act in two or three hours, I follow it with castor oil or with the solution of sal: Epsom, to which is added a small amount of rhubarb and some aromatic. This may be repeated *pro re nata*. Should the febrile excitement diminish while the patient continues feeble and languid, we may combine our laxative with some tonic remedy. I often exhibit, under such circumstances, the infusion of cinchona and serpentaria, holding in solution a proper quantity of sal: Epsom. If the bark disagree, gentian, colombo, or quassia, may be substituted. The bowels are sometimes so soluble, that nothing more is required to keep them properly evacuated, and institute the proper degree of determination to their secreting surface, than the occasional administration of an enema.

I have already remarked, that though constipation is still the general rule at the invasion of the continued fevers, yet that the instances have been of late becoming more and more numerous in proportion, in which there is intestinal irritation, with diarrhœa. This appears, in some, at the very beginning ; in others, supervenes at different stages of the progress, and in very many, will be found to constitute an annoying source of inconvenience and risk when the case has been long protracted, owing, as I am persuaded, to the follicular ulceration, so apt to arise under these circumstances of protraction. In some attacks, the abdominal uneasiness is throughout the most prominent evil, and is loudly complained of by the sufferer. On exploring the belly, an ex-

amination of which should never be omitted, you will often find it notably distended. This distention assumes two forms, readily separable from each other, and obviously connected with different internal conditions. The first of these seems to be mere fulness, by engorgement of the abdominal viscera generally—the liver, spleen, stomach and intestines, which remain soft, and suffer little from moderate pressure. The alvine evacuations here, whether spontaneous or solicited, are large in quantity, extremely offensive to the smell, and variously vitiated in appearance. The tongue is moist, furred, soft, swollen. The second is a true meteorism or tympanitic tension. The belly is elastic and resonant; usually, but not uniformly, very painfully sensible to pressure; a constant uneasiness is felt within; the breathing is embarrassed; the tongue is red and dry and pointed; the pulse is quick, tense and corded.

The two conditions thus described, must differ materially in nature and character, and so must the modes of relief applicable. In the first, the determination to the disordered parts is congestive perhaps, and irritative, productive of secretions morbid in quality and inordinate in quantity. In the second, the local affection is inflammatory or closely analogous; the surfaces being red and dry, with tendency to hemorrhagic exudation and ulceration. The formation of these follicular ulcers is affirmed to be preceded by the deposition of a tuberculous or purulent looking semi-fluid, immediately beneath the delicate epithelium which lines the villous tunic of the intestines; a sort of pustular eruption being thus formed upon that surface.

In the first, we should administer laxative enemata; and if these do not bring away the foul secretions from the whole canal, repeat our mild cathartics, such as castor oil, or the sulphate and carbonate of magnesia. Calomel in small doses may deserve a preference, and if there be much pain or colicky griping, should be combined with opium in the requisite amount. Indeed, opiates should hardly ever be omitted in these varieties of abdominal typhus. If this state of things be associated with diarrhœa, we must resort to astringents. Kino and opium are among the best of these; if they be inefficient, the acetate of lead, in full doses, will scarcely fail us. Warm fomentations and

poultices, with or without mustard, must be assiduously applied over the belly, and when these lose their effect, a large blister.

Meteorism or tympanitis is always an unpleasant symptom—doubly so, indeed, because while it darkly portends evil, it is apt to be the source of a high degree of suffering exceedingly persistent and difficult to relieve. If the abdomen be particularly tender on pressure, and the pulse and general strength such as to allow of depletion, the belly may be cupped or leeches. If the bowels be confined, a gentle laxative should be administered with some aromatic. An enema is often useful. *Assafoetida* may be employed either in this mode, or by the mouth, and is among our most efficient remedies. If any diarrhoea be present, opiates must be freely resorted to, and in full doses, given in pill, or mingled with small laxative clysters. Fomentations and sinapisms should here be assiduously applied.

To the Germans we owe the introduction of the nitrate of silver into practice in these cases of typhoid fever complicated with abdominal irritation and disorder. I have learned to confide much in the remedy—though I will admit that so far as I am yet able to pronounce, its exhibition is tentative; that is, we are not hitherto able to discriminate with clearness the particular instances to which it is specifically adapted. Hence it follows, that many have failed in their efforts with it, and thus it has not with us the reputation it deserves. I prefer to use it wherever tympanitis or diarrhoea present themselves, and I very frequently see the most gratifying effects follow its administration. I prescribe it in small doses—from the 10th to the 6th or 4th of a grain. The analogy is obvious and promising, of its decided influence over the inflamed and ulcerated states of the mucous membrane of the mouth, fauces, pharynx and larynx.

The heat and dryness of skin are often annoying symptoms in typhus. Such a state of the surface is usually associated with great thirst, a small, corded pulse, flushed face, red eyes and delirium. Here the cold bath is obviously indicated, and generally proves in a high degree beneficial; the patient urgently entreating its frequent repetition. When he is too weak to bear affusion or immersion, he will derive both comfort and advantage from occasional spunging with water, vinegar or

ardent spirit, which last is sometimes singularly refreshing. Few, indeed, are the cases of fever which are not palliated by the head-bath, water of low temperature being poured from some little elevation directly upon the vertex. This may be done at short intervals—most assiduously when the febrile exacerbation runs highest, the heat of skin is most pungent, and the intellect most disordered. Some patients are fond of keeping cold applied constantly to the head, and should be indulged. Napkins wrung out of cold water, or bladders of broken ice, may be used in this way.

Under the treatment thus detailed, your cases of typhus mitior will, in a very large proportion of instances, improve gradually and after a moderately long duration, say of twelve days to three weeks, recover. But if the attack prove obstinate, and the patient loses ground, or does not get better after a reasonable perseverance in this palliative course for five to ten days, your best general reliance is upon mercurials. Calomel should now be given in such doses as the stomach and bowels will bear without derangement or inconvenience, and at proper intervals, until its alterative influence is procured, as shown by a gentle ptyalism. It is remarked by one of the most enlightened opponents of the mercurial treatment of fever, "that if a patient is salivated in typhus, he is generally safe, but that we shall rarely be successful in procuring this effect of the remedy, and therefore it should not be relied on." The first clause of this statement is accurately true—the second, altogether erroneous. In the milder grades of typhoid fevers, now under consideration, we are scarcely ever pressed for time; the attacks are characterized rather by tenacity, than rapidity of progress. Disorganization, lesion of structure, takes place in many localities, certainly here, in but a small proportion of instances and very slowly, if at all—so that, if we can, at any period, subvert and interrupt the series of morbid actions which are going on, and substitute for them the transient influences of the mercurial affection, the condition of the sick man is, to say the least, materially altered for the better; according to my own experience, his recovery is very reasonably to be expected. Besides this, let it be remembered, that the mercurial does not, in any manner, interfere with such other remedial means as may be thought

necessary. The dose can be regulated so as to keep up the proper action on the bowels while we bathe, sweat or stimulate, as circumstances may require. If diarrhœa be present, combine your calomel with Dovers' powder or opium; or give, at the same time, kino or other astringent. Roupelle, of London, urges it here in the formula of hydrargyrum cum creta, and says it checks the diarrhœa; this is the customary prescription at St. Bartholomews, combined with Dovers' powder. I have, however, met with cases which could bear no amount of mercurial internally administered in any formula or mode of combination. Here I would dress with mercurial ointment all blistered surfaces, and rub it assiduously upon the skin of the thighs and over the abdomen.

Some further details may be necessary in regard to the management of the severer grades of typhoid affections, such as are referred to in the writings of the old English practitioners, under the title of "Typhus gravior"—the epidemic fever of more recent essayists—the jail, camp and hospital typhus—congestive and putrid and adynamic and pestilential typhus. Happily, we see little of this form of the disease in our immediate region of warm and free air. Indeed, I have never known typhus epidemic among the whites of the South; occasionally it prevails to an extent deserving the appellation on the plantations, where it is apt to commit alarming ravages and prove unmanageable and mortal. Among the free blacks of the Northern and Middle States it is very often prevalent, and the poor in all large towns suffer much from it. But it is on the other side of the Atlantic and in Great Britain, that it is most familiarly known and fearfully fatal. Its localities are numerous; wherever a dense population is living on scanty, innutritious food, and lodged in crowded and ill-ventilated habitations, it fixes its residence. Glasgow is, perhaps, its chief seat; it is perennial in Dublin, London, Edinburgh, Birmingham and Manchester, and the number of treatises concerning it, which have been furnished us from France and Germany, show its frequency there. Its contagious power of propagation is scarcely denied or doubted; its epidemic extension is proverbial, and to these influences are ascribed the terrible ravages which it has committed at various times and almost in every region. It calls for the promptest,

most judicious and most persevering application of all the knowledge, skill and resources of the physician.

In all classes of fevers, the principal danger to life consists probably in the irregular and disproportioned determination, as the phrase is, to particular organs, especially when these are of vital importance. Now this constitutes, in a remarkable degree, the almost uniform history of the severer grades of typhus and typhoid fevers. In no maladies which afflict the human race, is this inequality more striking. Not to speak of the more obscure derangement of the sensorial power—obviously disturbed, confused, and exhibiting strongly contrasted conditions in its various relations—nothing can be clearer than the proofs of extremely unequal distribution of the circulating fluids—the complete disruption of the vascular harmonies of the system. While the pulse, at the wrist, is just to be felt—threadlike, frequent and quick, the temporal arteries beat violently, the head throbs, the eyes flash, and the ears tingle. By Clutterbuck and others, the dangers of this unnatural condition are strongly urged, and the importance of instituting, without delay, the most impressive measures for the relief of this cerebral pressure, irritation, congestion or inflammation. At the head of these, many of them place venæsection, which is vehemently advocated here by high authorities. I have, indeed, seen it prove beneficial in some very threatening attacks, and will not, therefore, altogether reprobate the use of the lancet, but, on the whole, have witnessed so much disappointment and evil in numerous trials with it, that I must avow my opinion of its adaptation to the circumstances of the invasion of typhus to have become much less favorable than it was formerly. “There is risk,” says Good, in his zealous argument for blood-letting, “there is risk in the practice, but there is death without it.” If the violence of the invasion, and the apparent ability of the patient to bear this mode of depletion, should induce you to open a vein, proceed with caution, but avoid timidity. The patient may faint very early; press your finger upon the orifice until he recovers, and then let the blood again flow, and do not desist until you have effected your purpose, or you find injury and prostration about to ensue. I am convinced, however, that the circumstances of the case under discussion, are such as in general to render the use of the lancet

dangerous and unwarrantable. Even in fevers of open and undisguised excitement, when the subject evinces the tokens of ordinary vigor, I have thought it necessary and proper to caution you not to bleed too often or too much ; but here, where one of the most prominent symptoms is a marked degree of prostration with defective resiliency of system, you will need all your firmness of decision—all your courage in action, to support you in your resort to venæsection. Avoid it then altogether, unless in those attacks in which the disproportionate morbid determination affects so vehemently some vital organ, as to strike at once at your patient's life. Remember, too, that this period of invasion is, almost without exception, the only point of time at which any advantage can be derived from V. S. Its repetition, after the very first stage of the attack has past, is matter of the nicest experiment, and scarcely ever justifiable. Rush, indeed, ventured it in all imaginable contingencies, rather, it would seem, as an alterative, than with any other views ; and Jackson has gone so far as to maintain, that the loss of blood is rather stimulating than debilitating, on the ground, that by adapting the mass to be moved, to the enfeebled moving power, it directly invigorates the circulatory organs. I surely need not warn you against the unphilosophical error of thus regarding in the light of a ponderous and inert fluid, the warming, vivifying and nutritious current propelled by the heart.

Arteriotomy has been substituted by some practitioners, with the expectation that a greater effect in relieving special organs might be obtained with less actual loss of blood and of strength ; but as the determinations have seemed to me rather passive than active—congestive rather than inflammatory—I have not relied on it.

Topical blood-letting by cups and leeches is frequently had recourse to ; they are applied to the temples, the back of the neck and the epigastrium. While I do not object to them, and occasionally, indeed, employ them in cases of medium intensity, yet I cannot say that I regard them as of any great importance, preferring the opening of a large vein, whenever this mode of depletion is required or can be borne, on account of its more efficient revulsive influence.

The oppressed and nauseated state of the stomach will, in

many instances, require the early administration of an emetic. The antimonial promises most, not only by the local relief which it affords, but by the centrifugal determination which it occasions, and the consequent tendency to a full and free diaphoresis. It often acts as a cathartic, or at any rate, prepares the way for the purgative which must be given. Active or drastic articles of this class will not be borne ; but the bowels must be well emptied at first, and afterwards kept regularly moved, from day to day ; such laxatives being chosen as act both mildly and effectually. Moderate doses of calomel will usually suffice ; if there be constipation, it may be requisite to add rhubarb or ol ricini.

I have already alluded to the violent prejudices entertained by some practitioners against this course ; but it seems to me that there is no therapeutical rule more clearly established, than the propriety of thus relieving the intestinal canal, from time to time, of the foul, vitiated and irritating effusions with which, in the progress of a protracted attack, it becomes loaded ; and the general benefit to be derived from the excitement of a revulsive irritation and secretory action in this extensive mucous surface, thus diminishing the chance of injury to the brain and other organs rudely assailed by congestive, and perhaps inflammatory determination.

Let me remind you of the cold bath. It should be applied to the whole surface, if the skin be dry and pungently hot. Affusion upon the head from some height, is almost always useful in subduing delirium and headache. But when the skin is cool or relaxed ; when the lungs are oppressed with dyspnœa, thoracic pain or cough ; and when diarrhœa supervenes, at whatever stage, cold bathing is unsuited and forbidden. Here it may be well to substitute the warm bath, which is indeed generally indicated in what are distinguished as the congestive forms of fever. Occasional ablution with warm water—an essential element of cleanliness, must not be neglected in any case. Patients of the lower class, and especially negroes, require particular attention in this regard. Warm fomentations, and poultices with or without mustard, should be assiduously employed ; changing the points for their application as the seats of local uneasiness vary or are complained of more or less loudly, from time to time.

Now the chest—now the abdomen—now the spine, and now the extremities in their turn may be thus soothed and relieved.

Diaphoretics have long occupied a prominent place among the means of cure in these continued fevers. James' powder or the pulvis antimonialis of the shops, is well adapted in the early stages, if the stomach will retain it. As the case advances, the more cordial and stimulating sudorifics will deserve a preference; the infus: rad: serp:, camphor—the acetate and carbonate of ammonia—the tinct: op: camph: etc., may be used alternately or combined.

Should the pulse flag, and the debility, vascular and muscular, of the patient, seem obstinately on the increase, as shown by incapacity for motion, disposition to syncope when moved, a low delirium with muttering, etc., it becomes necessary to resort to the free use of stimulants of the highest and most diffusible effect. Of these wine is justly regarded the chief and most efficient, and least liable to objection. Wine whey, drank warm, is not only cordial and nutritious, but aids our diaphoretics. Arrow root and other mucilages should be rendered grateful and exciting by the addition of wine and spices. The white wines, Madeira and Sherry, are usually preferable. They should be sound and good. If there is diarrhœa, Port should be chosen. It is important that the patient should take his wine willingly and in sufficient amount. No medicine should be mingled with it, for fear of disgusting him or irritating his stomach. It should be made palatable to him in every way. There has been much discussion of late as to the employment of stimulants in fever; and various attempts have been made by those most favorable to their use, to discover and denote the conditions by which we should direct ourselves in this matter. For my own part, I look upon these niceties as rather superfluous, and prefer to be guided by the ordinary tokens of prostration and exhaustion, which surely admit of little occasion for error. As to the dose or quantity, I regard our exhibition of them as of course tentative or experimental. We must watch the effect produced, which will vary doubtless with the remaining susceptibility of the system. But I entertain few fears of injury where there is any reasonable degree of prudence exercised. Whatever theoretical objections

may be offered to the liberal employment of stimulants, it is often in practice our only alternative, and proves not unfrequently the means of restoration from circumstances otherwise totally desperate. When the necessity for their administration is evident then, let me advise you to proceed with boldness and energy. Anticipate, if you can, the exhausting influences of the disease, and prevent them. Give rather too much stimulant than too little. The pulse will guide you safely, if cautiously attended to. Go on, until you have aroused the circulatory powers ; but in regulating your farther prescriptions, you must not suddenly stop short, or you will lose all that seemed to have been gained.

If wine fail to excite sufficiently, or lose its effects by familiarity, substitute some form of ardent spirits. In them I have much confidence, and they may be made available in a great variety of modes. To these have been added capsicum, turpentine and cantharides, which have all been eulogized upon good authority, and may be tried in bad cases. Phosphorus has also been recommended, but I hold it in no regard. It is rather a local irritant than a diffusible stimulant, an objection which lies against cantharides also, though with less force ; for the latter excites vehemently an organ which bears well its painful effect, the bladder—and the strangury seems usefully revulsive ; while phosphorus is apt to inflame the stomach and intestines, and thus indirectly depress the vital forces. Of opium as a stimulant, I have not much to say. Following Brown, one class of physicians cry it up as of the greatest value and importance ; others again, denounce its exhibition under any circumstances in these low forms of fever. I scarcely fail to resort to it as a diaphoretic, in small doses, but prefer to stimulate with wine and ardent spirits, from the apprehension that in large amount it may tend to increase the prevailing determination to the brain. I avoid it when stupor or coma are present. In the opposite conditions of wakefulness and restlessness, I do not hesitate to administer it *pro re nata*. When there is pulmonary irritation, on the one hand, or diarrhœa on the other, I prescribe it freely, and with the most obvious advantage.

In the advanced stage of typhus, it has been recommended to exhibit, while the patient is kept under the influence of the

prompt diffusible stimuli above spoken of, some preparation of cinchona: Sulph: quinine is preferred by the majority, but you will find a strong infusion with some aromatic and alkali, a very serviceable formula. The mineral acids may be combined with it very pleasantly; they cleanse the mouth and teeth of the patient, and correct the fetor of his breath and his evacuations.

I have not spoken of vesicatories, which are, however, capable of being made serviceable to your patient, in two modes. They are very efficient revulsives, occasioning a strong centrifugal determination, and thus relieving the brain and other intestinal organs. They may also be so timed as to arouse the sinking energies of the frame, by their irritating impression upon the extreme portions of both the vascular and nervous systems. They should be applied successively, and at no distant intervals of time, to the extremities, (wrists, ankles, legs, thighs and arms,) to the epigastrium, and the course of the spine. If coma supervene, the head should be closely shaved, and after a few hours assiduous application of cold, if without effect, should be covered with an epispastic.

In these low fevers, especially in that class of them so long known as putrid fevers, the tone of vitality is so reduced, especially in the smaller vessels of the surface, that all inflamed points, such as have been reddened by sinapisms, or blistered, are apt to become gangrenous. Deep sloughs also form on the parts which are subject to pressure from the position of the body. This suffering and inconvenience may be diminished, at least, if not prevented, by a persevering attention. When the patient is too weak to change his posture in bed, he should be frequently turned by his nurses, and gentle friction by the hand applied over the surfaces on which he has lain. Soft pads may be placed under him at proper intervals, to relieve and alternate the points pressed upon; adhesive plaisters aid in resisting the effects of this pressure. Dr. Arnott has proposed the use of what he calls the hydrostatic bed—a sheet of India rubber cloth laid over a capacious vessel of water, which is said to yield in every direction, so that the weight of the body, instead of being supported upon certain salient points, is diffused over the whole recumbent portion. This bed, however, is not often to be procured, and it

has been proposed to substitute the ordinary caoutchouc air cushions filled with water, or rather, partially filled, and the expedient promises well.

When sloughs have formed and fallen out, the ulcers may be washed with the diluted mineral acids, and dressed with bark or the charcoal poultice. The chlorides also destroy their fetor.

During the whole course of the attack, but especially in these latter stages, it is of the utmost importance that the apartment of the patient be kept clean and well ventilated. His bed and body linen should be frequently changed, his person well washed, and every evacuation immediately removed. If, notwithstanding these precautions, the air of the chamber become offensive, the chloride of lime should be employed, or fumigations resorted to with the muriatic or nitrous acid.

I feel it my duty, before concluding my remarks upon the treatment of these severer grades of typhus, to say a few words more, concerning the propriety of an early resort to and steady dependence upon the mercurial, as an essential part of your therapeutics. Is it an object to change promptly the modes of action pervading every tissue, to subvert the morbid condition of the organs of the vascular and nervous system, to counteract the mischievous tendencies prevailing, and hurrying onwards to disorganization and death! How can these purposes be effected better than by the substitution of the all-prevailing mercurial affection of the constitution for its previous diseased state. Is the equable distribution of the circulatory fluid deranged, and some one or more of the important viscera obstructed and oppressed by venous congestion? "The power which calomel exerts in equalizing the circulation is no where more conspicuously displayed," says Armstrong, "than in diseases of a congestive character. Before its exhibition, the skin will be cold, wan and shrunk, the pulse feeble and oppressed, and the whole system apparently relaxed, but as soon as the mouth is made sore from its influence, the skin becomes warm and reddish, and distended with the vigorous circulation, while the pulse is full, soft and strong, and the general energy is in a great measure restored."

"Mercury should be freely given," says Grattan. "The moment the mouth becomes sore, the symptoms are rendered less

violent, and the patient thenceforward gradually recovers." This experienced writer, with almost all others who have witnessed its effects on any extended scale, ascribes to it an unequivocal power of resolving congestion and equalizing the circulation.

Is there present inflammatory determination to some vital organ, menacing rapidly a fatal lesion of structure? To what remedy shall we here resort, after such depletion as circumstances may permit, to what remedy shall we resort with any hope of benefit, but to calomel? If it were required to sum up, in aid of my feeble recommendation, the weight of authority to establish the utility of mercurials in visceral inflammations, I should be obliged to recite to you the names of almost all the distinguished practitioners of Great Britain and America, of the last as well as of the present age.

It is idle to say, and yet this is the principal objection urged against our reliance upon it—it is idle to say that "the mercurial is too slow in its action, and that the patient will die before we can procure its remedial effect." No other reply to this cavil need be given than the following quotation from Armstrong: "Well knowing that every moment is inestimably valuable in these rapid cases, I have given generally a scruple of calomel at first, repeating smaller doses three or four times on the first day of the attack, etc. You most frequently obtain the ulcerative operation of the calomel within the first or second day, which is a circumstance highly to be desired."

You must observe that he is here speaking of the most pestilential varieties of typhus, such as occur in jails, ships, hospitals, in camps, and other crowded and ill ventilated places, prevailing epidemically and spreading by contagion, and exhibiting the greatest degrees of intensity. The disease in this country, at least as far as I have met with it, is of less malignant character and less rapid in its progress. We have, therefore, more time for the employment of remedial means, and on that account have more to hope for from the exhibition and efficacy of mercurials.

I am disposed to attribute to some peculiarity in the constitution of the negro race, as well as to their characteristic habits, the so frequent occurrence of typhoid fevers in our black popu-

lation. The filthy state of their skins, covered with a rank and greasy exudation, and rarely washed or even imperfectly cleansed by change of garments, owing to their indolent habit of sleeping so commonly in their clothes, contributes with the gross and irregular diet to which they are addicted, to lower the tone of vitality among these unthinking and reckless creatures. The first recommendation necessary in the treatment of such patients, and surely not one of the least important, is the immediate use of the bath, cold or warm, according to circumstances formerly spoken of, but generally preferring the tepid, and the placing them in unsoiled bed and body clothes. The countenance of the sufferer will immediately brighten, and his dejected spirits revive at these instances of attention; and the prospect of a speedy cure will be decidedly influenced by the cheering and stimulating effect of this, perhaps unwonted kindness, upon his whole frame.

I cannot take too much pains to impress on you, gentlemen, the sentiment that you are to be in their hours of sickness and suffering, the friends and benefactors of this subject race, too stupid and thoughtless to be entrusted with the care of themselves, and but too apt to be less than sufficiently cared for by their superiors. The most pointed neglect, however, under which they groan, is that of their own associates and companions, who look with an eye of the most absolute indifference upon their pains and sorrows, and listen to their complaints without pity, and often with undissembled impatience. It will be necessary that you examine closely into the treatment of the sick, by these their fellows, when appointed their nurses. Inquire and ascertain whether the medicines, food, and drinks ordered, be given to them, and whether regularly, or at such intervals as may suit rather the convenience and indolence of the attendant, than the wants and requirements of the patient.

For a faithful and observant discharge of your duty in these minute, but not unimportant particulars, you will often be repaid by the recovery of the sick man, his gratitude to you as his preserver, the respect of the community, who never fail to set as high a value upon the amiable qualities of benevolence and sympathy, as upon professional skill, but above all by the approbation of your own consciences, the best and most certain reward of virtue in this our earthly sphere of action.

CHAPTER X.

PNEUMONIA TYPHOIDES.

THE only remaining individual in the class of idiopathic fevers is the disease so widely prevailing at times over the North American continent—its eastern portion especially, and generally recognized among medical men under the title of *Pneumonia Typhoides*.

There has been much controversy as to the nature and character of this strange malady, and many names significant of this diversity of opinion have been given to it. Every point in its history has been made matter of dispute; it was long undecided whether it is a new disorder or a modification of some of the better known and more ancient shapes of disease; some writers refused to arrange it at all under the head of fever, and there were warm and interminable debates as to its origin and mode of propagation.

The study of this singular affection is peculiarly interesting and instructive. It demands our attention from the fact of its not unfrequent sporadic occurrence during our winters, in some of which, when severe, it has indeed seemed, even within a few years back, disposed to resume its earlier epidemic sway. Its appearance is always productive of anxiety and alarm, from the menacing aspect it puts on, and the real terrors which attend it; and its proportional mortality has been, in many places, seriously great. It is distinguished by its extreme liability to undergo modifications of history, symptoms and results, from every diversity of circumstance, constitution and locality. Indeed, such influence have these contingencies exerted upon its very characteristics, that it is not easy to recognize it in its several mutations, and it is only by carefully collating the numerous notices of it which have been published, that we shall be able to trace it through these striking changes, and satisfy ourselves that such almost contrasted pictures are intended, indeed, as portraits of one common pestilence.

It is of little consequence to decide whether this is a new disease or a mere re-appearance of the ancient *febris petechialis*; it

certainly put on, when first it attracted attention, many unaccustomed features, such as caused it to be regarded by the Eastern physicians as an unknown affection—one which it was difficult to recognize as described in previous medical histories.

In some of its forms, it so closely resembles catarrhal fever, or influenza, that many have been disposed, on this account, to deny it a separate existence; in others, it seems almost merged in the severer grade of typhus; some writers conjectured it to consist in a hybrid combination of these modes of disease, who nevertheless considered it, like a mongrel fruit or flower or animal, to be distinct and peculiar, demanding its own proper name and its own specific management.

In its invasion there is an indefinite uncertainty as to the organ or part which is to suffer primarily, or upon which the chief force of morbid determination shall be directed. Thus the brain, the throat, the lungs, the heart, the stomach, the intestines, might each in turn, become the centre of diseased sympathies. The functions of the viscus thus assailed, are frequently put a stop to at once, and its very structure not uncommonly found to have undergone rapid and striking deterioration.

Sometimes the sympathies brought into play, are of the most indirect and obscure kind; the whole local affection is fixed or concentrated upon some remote or comparatively unimportant portion of the body or limbs, and the patient may sink and die complaining of nothing but a painful or distressing sensation in the part so affected. Even now, when the excitement of the time has past away, and we sit down to peruse coolly the writings of the early authors who described it, we cannot but feel that these circumstances were in the highest degree calculated to throw round it a veil of gloom and mystery, which might well thrill the hearts of the stoutest with awe. No one was safe, and each might be seized in this insidious manner; the springs of life might be dried up while the stream was flowing most purely and freely. Rumor, of course, magnified infinitely the number of this class of cases.

I have said that this malady was specially liable to be modified by circumstances. Thus, while it scarcely differed from ordinary catarrhal fever in some situations, in others it appeared little more than a violent inflammatory congestion of the lungs—

like the lung fever of the eastern states; and in others still, the chief symptom was a pulmonary congestion, little or not at all inflammatory, resembling what has sometimes received the denomination of pulmonary apoplexy. In some districts it was ushered in by a chill, long protracted, extremely distressing, and indeed, in many cases fatal, whence it received its common title of cold plague. At its commencement, so many of the cases presented a cutaneous eruption, or the occurrence of petechiæ, that the vulgar called it a spotted fever, and the learned a pestilential typhus, or as I have said above, a return of the old febris petechialis. It is strange to find how soon in its progress it lost that feature, even in the very localities where it had been most marked.

Of all the numerous denominations affixed to this proteiform disease, I have selected the one which has received the most general sanction of medical men in the southern and middle states. In a large majority of the cases which I have seen, in the different sections of our country and at different periods, there has been an inflammatory affection of the thoracic viscera, associated with that impairment of sensorial energy and morbid state of vascular action which we meet with in typhus gravior. It is, therefore, I think, very properly styled a typhoid pneumonia. But it is not a mere pneumonia; for not only is this inflammatory affection of the respiratory organs occasionally wanting, and inflammations and congestions of other parts substituted, but in a very numerous order of instances, the peculiar and characteristic disturbance of the sensorial and circulatory systems has been of such paramount importance as to have determined promptly the fatal event. Hence I do not hesitate to regard it as an idiopathic fever; the correctness of which opinion could only have been doubted by those who make hot skin and vascular excitement essential standards or diagnostic marks of fever.

Some have been disposed to arrange it as a mere pneumonia, among the diseases of the respiratory system; but this error can readily be shown to have arisen from a narrow view of the facts. I have already said, that in many instances the fatal progress of the attack has been determined without any definite relation to local affections of any kind, and surely we shall find some of

the worst and most malignant invasions of this epidemic divested of all special reference to the lungs or their appendages—some affecting the brain and spinal marrow, others being simply anginose, and a third and somewhat numerous class, altogether anomalous, probably depending upon a morbid impression simultaneously made upon the whole sensorial system in all its wide expansion.

The first notice we have of its appearance, was in the year 1806, in Medfield, a town of the state of Massachusetts, whence it spread gradually—extending itself, winter after winter, throughout New-England, into Canada, and the Middle States, progressing from village to village, and from one portion of the country to another, until in 1813, it had reached Philadelphia. In the winter of 1815, it first prevailed in this state, and was then, and more widely in 1816, epidemic; since which time its ravages in South-Carolina have been slight. It continues to show itself sporadically, every where I believe, where it has once found footing. We scarcely pass a winter without meeting with instances of it, especially among our blacks.

It has not advanced farther south than the State of Georgia, nor has it been very familiarly known beyond the latitude of this city. The winter and early spring, seem to be the almost exclusive seasons of its occurrence, yet exceptions do happen, for I have seen two distinct cases of it during the present month, (June, 1838,) one in a white female, and the other in a black man.

From the gradual extension of the disease, in which it is strongly contrasted with common influenza or epidemic catarrh, many have been disposed to infer its propagation by contagion; but of this doctrine the proofs are not clear. Nor do we know distinctly its mode of origin. It has certainly some relation to the sensible qualities of the atmosphere—as its dampness and coldness, and occurs most obviously in those peculiarly exposed to these agents, especially if the exposure be protracted. Blacks are observed to be peculiarly liable to its attack. Children seem to enjoy a special exemption.

It must, I think, be remarked as a singular fact that the pneumonic or pulmonary form of the disease is far more universally prevalent in the southern than in the northern districts in which it has appeared. It is in these latter, contrary to all reasonable

expectation, that the anomalous and irregular varieties have been met with most frequently. In New-England it has also been observed, that it is much more violent and fatal in low, swampy regions, in the neighborhood of bogs, mill ponds, etc., as if it depended in some measure, upon malaria influences; while in our own miasmatic low country, equally damp and vastly more subject to malarious fevers, nothing of this sort has been noticed.

The petechiæ on the surface, which were at first so prominent a symptom as to give both name and character to the malady under discussion, soon ceased to attract attention, and may be said hardly to have belonged to it when it reached the country south of the Potomac. Yet this was not merely the effect of modifying influences of climate, for they had before this time as it is affirmed, failed to exhibit themselves in cases occurring in the native localities of this strange pestilence.

Until quite recently, none but American writers seem to have noticed this form of disease. The first trans-atlantic physician who speaks of it, is Dr. Stokes. It is very well described by him, under the title of "typhoid pneumonia," as not uncommon in Ireland. Dr. Burne, of the Westminster Hospital, mentions that a great many cases of what he calls "the spotted fever," were brought into the Hospital early in 1838. It is, he says, "an adynamic or typhus fever, combined with a latent and dangerous pneumonia, and exhibiting on the surface a very regular and uniform spotted eruption—not petechiæ."

Causes. I have already stated the undisputed relation between the occurrence of occasional cases of pneumonia typhoides and the damp, cold atmosphere of our American winters. But we cannot thus satisfactorily account for its origin where the same causes had previously existed without producing it, nor for its spreading into more genial climates, nor for its gradual or continuous progress in various directions, from its first seat. On these points we must acknowledge entire ignorance. I have personally seen no proofs of its contagiousness. It is usually spoken of as epidemic, and as dependant upon some unknown qualities of the air. A predisposition to it arises from all those contingencies which effect considerable or permanent depression of the vital energies, such as a damp, low, ill ventilated dwelling, insufficient food or clothing, labor beyond the strength, or

continued fatigue. Its exciting causes are such as induce catarrh or pleurisy; exposure to cold, especially if long protracted, sudden vicissitudes of weather, or striking and hasty contrasts of temperature, getting wet, etc., etc. It is asserted to show a remarkable disposition to attack adult males of middle age, we know not why, in preference to women, or to the very old or young.

This pestilence affords us a strong exemplification of the general and prevailing force of predisposition or predisposing causes in modifying the form and character of disease. The variety of shapes which it assumed, and the uncertainty which attended its progress from place to place, were beyond all precedent. The condition of constitution of the individual attacked, the situation of his residence; his habits of life, and an indefinite number of analogous circumstances, stamped their influence upon every invasion of this epidemic, and still continue to determine, from time to time, a sporadic attack of greater or less severity.

Symptoms. In attempting a delineation of so cameleon-like a malady, we must pourtray separately and in succession, the several modifications presented in different places and under various contingencies. The most ordinary form of pneumonia typhoides—that which was at any rate far most frequently met with in our own district of country, is ushered in by a chill of uncertain intensity and duration, very often, however, exceedingly protracted. This is accompanied or followed by extreme pain in some part or parts of the body—usually the head and chest. A notable prostration of the muscular strength attends almost universally, with general uneasiness and restlessness. In a very large majority of cases, there is some dyspnœa, with cough, which aggravates greatly the thoracic pain; sometimes stricture and oppression of the breast are complained of. The respiration is hurried, uneasy, irregular; there is deep and heavy sighing; a weight is felt at the præcordia, with nausea, gastric distress, and it may be vomiting. The tongue is clean, but red. The pulse is small, quick, frequent—not capable of bearing much pressure. The spirits are much dejected; in many cases there exists, from the commencement, a degree of delirium, which sinks gradually as the patient grows worse, into the low mutter-

ing, characteristic of true typhus. The temperature of the surface is irregular and unequal; the skin is sometimes harsh, hot and dry; at others it is relaxed, cool and clammy. I have often seen it continue from day to day, little altered from its usual condition and warmth.

If the patient be not relieved, the typhous symptoms become aggravated, the tongue dries and chaps, or is covered with a dark crust; the teeth and lips are foul, and the whole lining of the mouth encased with tenacious sordes; the previous restlessness and pervigilium are exchanged for stupor and coma; the pulse becomes weaker and undulatory; the breathing is more and more difficult; and death ensues at a very uncertain period. Or about the ninth, tenth or eleventh day, the pulse rises, becoming more voluminous; a soft warm moisture bedews the surface, the delirium subsides, and the sick man slumbers pleasantly, and wakes more cheerful; the cough is less annoying; the thoracic pain and dyspnœa gradually yield to a full and easy expectoration, and a slow recovery comes on.

Such is a description of the most common, most manageable, and least fatal variety of pneumonia typhoides. Yet your prognosis, even in this class of cases, is somewhat doubtful, and requires to be cautiously regulated by the circumstances of each individual example. As in true typhus, all those tokens which go to show any increase of nervous prostration, or any farther impairment of vascular energy, are unfavorable. Among these, are great anxiety and dejection of mind, or the opposite extreme of inattention and indifference; constant restlessness, or peculiar muscular feebleness; want of susceptibility to external impressions as from sinapisms and blisters; sighing or frequent yawning, or any other mark of increased thoracic oppression. Percussion, in such instances, returns a dull sound; and there is imperfect respiratory murmur. Lividity or dark complexion of the countenance; petechial spots on the surface; a fixed state of the pupil of the eye, whether contracted or dilated; the exhalation of a cadaverous odor, and frequently coma, precede dissolution.

On the other hand, the renewal of attention to surrounding objects; the return of intelligence, of cheerfulness and hope; fuller and freer breathing, with improved resonance and respira-

tory murmur, moderate expectoration, a pulse slower and more voluminous; more equable warmth of surface, with a tongue paler and moister, give presage of recovery.

The duration of such attacks as these, will average from six to ten days.

The next most common form of pneumonia typhoides, resembles much, in its onset, the bilious pleurisy of the southern portion of our country. There is pain in the chest, usually sharp and cutting, rendering the respiration short and difficult. There is great gastric oppression, frequently with retching, and vomiting of foul mucous and bilious secretions. The countenance is flushed, the eye red and watery; there is aching of the head, back and limbs; the pulse is full, but unduly soft and compressible, soon becoming feeble and losing its volume. This stage of vascular excitement is short; muscular prostration soon supervenes, and the circumstances of the patient become very similar to those described in the first instance.

It has happened to me to meet with several impressive examples of this disease, in which the principal symptom was a peculiar pulmonary congestion. Some diffused uneasiness throughout the chest is complained of, but no acute or severe pain. Dyspnœa attends, which soon becomes urgent; the pulse is usually very frequent; the strength fails, the skin is covered with a clammy sweat; there is little or no febrile excitement; the tongue is moist and clean; extreme anxiety and fear of impending death oppress the patient, with restlessness and inability to sleep.

The prognosis in such cases is very unfavorable. On exploring the chest, the respiratory murmur will be found almost inaudible, in a great portion of the lung, either of one or of both sides, and the resonance lost in a similar way and extent. I have seen a stout young man die in about six hours from the invasion of this form of pneumonia typhoides, and a young woman sink in about thirty-six, in spite of the most energetic and best directed efforts for their relief.

These may, perhaps, be considered the more regular conditions of the disease of which I am treating; but my delineation of it would be unpardonably imperfect, if I failed to notice its singular anomalies. These, I have already said, were often very

obscure and unaccountable, and excited, during the prevalence of the epidemic, a degree of alarm, which, to one who now peruses coolly the histories of such cases, and reflects on their comparative rarity, seems altogether groundless and romantic. I shall never forget the consternation which followed the occurrence of some of these mysterious and fatal attacks, in the college of which in my boyish days I was a member. A moment's consideration will suffice to convince any one, however, that such panic was natural and not unreasonable. Stories were every day circulated, subject to the indefinite exaggerations of common rumor, which were based on facts truly impressive. Some of the victims of the pestilence were struck down while at work in the fields, and died before their friends could convey them home. Others again seemed to be taken off by the most inadequate ailments, "dying," as the phrase was, "of a pain in the foot or knee—in the ankle or wrist."

A singular variety of the epidemic is described in the "Report of the Committee of the Massachusetts Medical Society," as occurring chiefly or exclusively among females,—where the symptoms were "universal deadly coldness, the skin as white and smooth as polished marble, the countenance perfectly placid, not one distorted muscle, the pulse imperceptible at the wrist, respiration only by gasping, and that not frequent." I know not in what language could be conveyed a more graphic picture of exquisite congestion—intense and perfect capillary paralysis.

Of all these irregularities, however, the most malignant are the anginose cases, those in which the throat is the part affected. These were fortunately rare, and have been met with in greater number in the Middle States, Pennsylvania and Maryland, and the northern portions of Virginia, than in the Eastern, Western or Southern sections of our country. The attack is insidious. The patient seems to labor under mere catarrh, with slight cyanache, but, on a sudden, respiration becomes much impeded, and great prostration of the universal system supervenes. The throat and fauces are found to be of a dark brownish or mahogany color. The exhaustion of the vital powers is usually represented by those who have had the misfortune to meet with instances of this kind, as singularly prompt and uncontrollable.

The actual mortality of pneumonia typhoides has been very

differently represented by different writers. After a careful collation of the several histories published of its prevalence at various times and places, I am persuaded that it is by no means so dreadful as you would be disposed to anticipate from some of the more melancholy statements. I would not compute the deaths at more than one in ten on the whole—an inferior proportion to that of the more serious forms of typhus in many parts of Europe—to that of yellow fever, or of the plague, or of Asiatic cholera.

The convalescence is almost always slow, irregular, and for a long while imperfect; yet, when once attained, it has not struck me that the constitution has been permanently impaired, or that any notable predisposition has been generated or aroused to any other form of disease.

Autopsy. The morbid appearances after death correspond generally with the character of the fatal attack. In the more ordinary cases, the thoracic viscera having borne the force of the invasion, exhibit most obvious traces of its sway. The lungs are solidified or hepatized, heavy, and of a dark red color—the vessels both of the pleura and lining mucous membrane engorged, with adhesions of the pleuræ. The heart sometimes shows the effects of inflammation, presenting on its surface flakes of organized lymph.

The brain is usually more or less altered in appearance, its vessels filled with dark blood, and effusions of serum, of coagulable lymph, and even of purulent looking fluid, are occasionally found upon the surface of the membranes, in the ventricles, and even, it is said, within the cerebral substance. The blood is, as in typhus, of a particularly blackish hue.

Treatment. Concerning no individual in the long catalogue of human maladies, has there been more division of opinion in this regard. While some physicians, of the highest standing, vehemently condemn all evacuations, and every mode of depletion as eminently injurious and even fatal in their tendency, others, of perhaps equal respectability, inform us, that the most active antiphlogistic measures are peremptorily demanded, and indeed absolutely essential to success. It is only by keeping in mind what has already been stated, as to the very great diversity of character assumed by this disease, at the various periods

referred to by writers, in the separate districts of country which it invaded, and in the different constitutions which it assailed, that we shall be able to comprehend, or in any degree to reconcile, these contrasted sentiments. We must here, as in all other analogous cases, govern ourselves by those general principles which experience and reflection have proved to be adequate to our guidance; making due allowance, in our application of these principles, for all the modifying circumstances observed to be present and acting.

The pneumonic form of this epidemic, has hitherto been, as I have told you, the most common in our Southern region, and it is the type which you will, from time to time, be likely to meet as occurring sporadically. The thoracic distress—the pain so often felt—the difficulty of respiration: these well known symptoms of pulmonary inflammation and congestion, will at once suggest to you the familiar remedy so often tried and so justly relied on in cases apparently analogous: I allude of course to venæsection. You will be struck, while perusing the papers from various sections of the country, to find so much more testimony in favor of the use of the lancet from Southern than from Northern practitioners, and you will be led to infer, that the typhoid character of the pestilence was much the most strongly pronounced in the colder climates, while the local inflammatory affections were more prominent in lower latitudes. Such, indeed, I suppose to be the fact, for we are well aware, that our Eastern brethren are by no means timid phlebotomists. They are, however,—at least, in the earlier documents—almost unanimous in deprecating the resort to blood-letting, as attended with the greatest possible risk.

On the other hand, there are in the Carolinas many physicians who almost invariably commenced the treatment with venæsection. Dr. Trent, of Richmond, Va., states that he bled in this disease more copiously than he had ever done before. He tells us that he took from many patients, with the happiest effect, from twenty-five to fifty ounces of blood at once, and sometimes repeated the detraction to nearly the same amount. The blood, he says, was always cupped and sizzly.

In the cases that have occurred to myself, the lancet has been seldom required or admissible. I have employed it more than

once experimentally, in my anxiety to give relief to pulmonic pain and dyspnœa. In some of these instances, a certain degree of advantage seemed, indeed, to have been gained, yet though I proceeded with much caution, and had selected the cases not only as appearing to be well adapted for the trial of the remedy, but as demanding a resort to it, the consequent prostration was in each of them alarmingly great, and difficult for the patient to recover from.

It is true, that we have here a very unequal distribution of the circulating fluids—the force of morbid vascular determination, too, is thrown upon organs of vital importance. Yet these local determinations are of peculiar character, and must be regarded as congestive rather than inflammatory.

“The fluids,” says a Northern writer, “are too stagnant to be drained off by venæsection.” Indeed, this local engorgement, of whatever set of organs, is often so tenaciously obstinate, that it does not seem to be affected, in any degree, by whatever subtraction from the mass of blood, while the general system is promptly depressed, and if great care be not taken, irrecoverably prostrated.

In some instances, it has been proposed on account of the difficulties which embarrass us, “to give cordials and open a vein at the same time.” Yet, with all these efforts at obtaining the beneficial influences of blood-letting unalloyed by its injurious tendencies, the general result of the practice will be, I fear, that for the most part you will be disappointed in the expectation of procuring even a temporary respite from suffering by it, which, if you are, on the other hand, successful in gaining, you will find to be more than counterbalanced by the consequent exhaustion and debility.

Of course, you will not understand me as offering any objection to the use of the lancet in attacks marked by a predominance of the tokens of obvious inflammatory excitement. I have not a doubt that this was the general character of the epidemic in those localities whose resident physicians report the success of a free and bold resort to the antiphlogistic regimen in its full extent.

I have been much pleased with the effect of the early administration of an emetic, or an emetico-cathartic, where the case is

seen at its commencement. A very common formula is the combination of tartarized antimony, or of ipecac: which I prefer, with calomel—the domestic mixture of sal: Epsom dissolved in a strong infusion of seneka or serpentaria with the same emetics, may also be used.

By the double action of these prescriptions we not only cleanse thoroughly the stomach and intestinal canal, a step which experience has shown to be of great importance, but we effect the paramount object of creating a centrifugal tendency of the fluids and determining energetically to the surface. We thus most safely and effectually remove the local congestions which constitute the most serious and characteristic portions of the disease, and restore the impaired equability of the circulation. This remedy, however, the emetico-cathartic, is obviously unsafe and must not be trusted to in some of the more exquisite examples of early prostration and extreme muscular weakness. In such cases we resort at once, without previous employment of any means of depletion, to the moderately stimulating diaphoretics, under which head we find our second class of measures, when we have premised the emetic and cathartic. Of these, camphor, nitrous æther, the carbonate and acetate of ammonia are the best, and are made more beneficial by combination with opium, and especially with Dovers' powder. The efficacy of all these will be much aided by the pediluvium, and by the application of warm fomentations, poultices and heat in various forms to the surface of the patient. Cataplasms with mustard must be laid over the chest, if pain or dyspnœa are present, and applied to the wrists and insteps. Epispastics are also of use here, by their double power as stimulants and revulsives: the back of the neck, if the head be affected; the sternum, and the epigastric region, if the lung or heart or stomach suffer, should be selected for their application. There has been some dispute as to the preference due to the dry or moist form of heat, as the best to be resorted to in this disease. It is, I think, easy to decide. If the skin be dry, I prefer fomentations, or even the vapor bath; if moist, I prefer bottles of hot water, heated bricks, bags of hot salt, chaff, etc. Sweating will, in the greater number of cases, come on readily, but must be regulated. If too profuse, and kept up for too long a time, it may prove injurious and debilitating. You

restrain it by substituting dry for moist applications, and removing some of the bed clothes, and changing cautiously the body linen of the patient ; dry garments, carefully and well aired, being put on in place of those moistened by the cutaneous discharges.

If the strength seem to fail, your stimulants must be used more freely—the vol: alkali in large doses, from 5 to 10 grains every half-hour or hour, with wine whey or brandy toddy ; spts: nit: dulc:, spts: turpentine, the tincture of cantharides, may be given alternately or in combination. I can set no limit to the administration of this class of remedies, but the excitement of a notable degree of re-action, which being observed, will guide you in the future quantities to be exhibited ; taking care, however, that the patient shall not suffer by their timid or inefficient amount, nor be allowed to retrograde by any sudden subtraction of dose.

Where the pulmonary congestion is intensely great, your task will be extremely difficult. I scarcely know a case in which our ordinary medicines produce less effect—the lancet is inert. Fomentations and poultices made irritating by mustard, must be applied assiduously about the chest. I have resolved, in the next serious instance of this sort which shall come under my notice, to give the spts: terebinth: in large doses, or to depend upon the free exhibition of camphor in substance.

In the form of pneumonia typhoides, which so closely resembles the bilious pleurisy of the South, when the symptoms of gastric distress are combined and prominent, a mercurial cathartic should be first prescribed, and the bowels kept afterwards moved for some time with a solution of sal: Epsom in the infusion of seneka or serpentaria—as revulsive and sudorific. If the retching and vomiting are troublesome, and refuse to be controlled by the effervescing draught, lime-water, and mustard poultices to the epigastrium, I would advise opium, in small doses, and a blister to the scrobiculus cordis. I have never had occasion to press the mercurial treatment to any extent in pneumonia typhoides, but it has been highly recommended by many writers, and among others in the very able Report of the Committee of the Massachusetts Medical Society in 1810–11. If ever applicable, it must be under such conditions as we are now

considering. Stokes speaks very favorably of it in his account of the Dublin epidemic.

Many of the treatises upon this strange disease are filled with eulogies of opium, a remedy which seems to have been applicable at almost every stage, in every modification, and in every locality where it prevailed. Its full and free use has, in my own hands, been so universally required, and productive of so much relief and comfort to the suffering sick, as constantly to recall to my memory with sincere acquiescence in their propriety, the forcible expressions of the older writers concerning it, where they styled it "*divinum remedium! magnum Dei donum!*" There is, indeed, no substitute for it—no second to it, in the *Materia Medica*. It alleviates the oppressive dyspnœa so often present, promotes the expectoration of the thick, ropy mucus effused in the lungs, diminishes the anxiety and dejection of mind which harrass the patient, often restores his reason when delirious, determines to the surface, gives new vigor to the circulation, and re-excites the nervous energy. It alone possesses the power to control the troublesome retching and vomiting sometimes present—to calm the incessant and insupportable restlessness of the sufferer, and procure for him a tranquil and quiet slumber, that most delightful solace of the sick and afflicted. It may seem to you, that I am running into an enthusiastic and exaggerated statement of the influence of this most valuable drug; but I believe you will fully acquit me of the charge, when you have had opportunity of witnessing its excellent effects.

It was, as we are told, the only means found to be of any efficacy in the lethargic and other anomalous and malignant cases formerly described to you; and the doses which are affirmed to have been exhibited with advantage in such attacks, are prodigiously large. It is stated in the *Massachusetts Medical Journal*, (vol. II., p. 149,) that from fifty to one hundred drops of the tinct: opii have been given every half-hour with success. In one case, mentioned there, a scruple of solid opium was taken in the course of three hours—in another, forty-two grains in forty-eight hours. When deglutition was impracticable, the best results have followed its free exhibition in enemata.

In my own practice, these enormous amounts have never

been required ; I have obtained the most undoubted benefit from the medicine in the usual doses, freely but cautiously adapted, and repeated with a frequency proportioned to the exigencies of the case.

I have met happily with no example of the terrible modification affecting the throat with malignant inflammation, and termed "anginose." In these, it is advised to apply a blister to the front of the neck, which must be kept open and discharging. Besides this, and in addition to the other stimulants and diaphoretics above recommended, I should be disposed to employ, as in cynanche maligna, the *infus: capsici* in free quantities as a drink, and use it abundantly to wash the throat.

It is well to be reminded, that in this strange disease it is never permitted to despair of your patient, recoveries being in considerable number recorded, from circumstances the most deplorable, and indeed, to all reasonable anticipation, absolutely hopeless.

The convalescence is so slow, difficult and irregular, as often to require unremitting continuance of your care and attention. You must subtract gradually from the amount of stimulants which have been given him, and substitute, in their stead, the more permanent tonics. Of these, each practitioner has his favorite. Arsenic is preferred by many of the New-England physicians, and is, without doubt, highly serviceable. The muriate of iron is also spoken of as well adapted. I am in the habit of trusting rather to *cinchona*, combining it in infusion with *serpentaria*, to which I add a small proportion of *carb: potass: and tinct: op: camphor*.

Your convalescent should wear flannel next his skin for some time. His clothing should be carefully adapted to the season, and he should avoid, with especial prudence, all exposure to moisture and to sudden alternations of temperature.

CHAPTER XI.

SYMPTOMATIC FEVER.

HAVING gone through, in sufficient detail, the consideration of the Idiopathic fevers, properly so called, I proceed to make a few observations upon those which deserve, by way of distinction, to be regarded as Symptomatic or Consecutive. I enter upon this topic, which will not occupy us long, the more willingly, on account of the opportunity afforded us of marking the obvious differences which so widely separate the two classes. You will thus be satisfied, I think, better than by the most labored argument, of the practical absurdity of confounding these two modes of febrile disorder—the one obviously connected with local injury, derangement, or irritation, of whose existence and the influence exerted by it in the production of the constitutional disturbance, and their necessary mutual connection and dependence, there are the most clear and pointed and unequivocal proofs; the other, inferred to be similarly connected with and dependent upon a like irritation or derangement, whose seat and nature are both matters of obscure conjecture; and this inference merely founded upon a doubtful and disputed analogy.

Symptomatic Fevers may be divided into the Continued and Intermittent—none of them assuming, so far as I know, a fairly remittent type. They may arise from causes both external and internal. They may, in both forms, be connected with the same local excitement; and in such cases, the Continued will be found to precede the Intermittent,—the former being connected with recent injuries and acute inflammations; the latter taking its origin in chronic and subacute phlegmasiæ and organic affections doubtfully classed among the phlegmasiæ; and supervening upon old ill cured external wounds and injuries. The former is hence frequently denominated inflammatory fever; the latter is better known as hectic fever—the fever exquisitely of irritation. With inflammatory symptomatic fever, you are to become familiar, as following within a short period wounds of the soft parts, fractures of bones, injuries of the head, violence done to a

joint. Whether or no there is any essential pathological circumstance wanting, as some have been disposed to contend, which should induce us to withhold the title of fever from the disturbance of the system in instances of this kind, is not as yet perhaps absolutely decided. We have here, however, beyond dispute, all the common phenomena which go to constitute the ordinary definition of fever. The hot, dry skin ; flushed and turgid face ; suffused and red eye, anxious countenance ; tongue red and coated with fur ; stomach uneasy and irritable ; great thirst ; headache ; languor ; muscular debility and weariness ; with occasional delirium, and a pulse frequent and tense and abrupt—form a picture which cannot fail to be at once recognized. Here the exclusive humoral system is inapplicable, and Stevens' views as to the morbid condition of the circulating fluids seem out of place. What proof have we of any incipient change in the blood ! Nothing of the kind is even pretended. This is the history too, as well of the febrile affections connected with internal inflammation, as with external injury. It is a description not only of the consequence of a severe wound, but of the state of the general system in pleurisy, rheumatism and sore throat. It may in both become of paramount consequence, and perhaps deserve to be regarded as even more important than the local affection. Yet its nature will be modified to a certain extent by the seat of the local excitement, and by the circumstances in which the subject is placed. In gastritis proper, for instance, and enteritis, we have a low and weak febrile condition, the pulse being small and feeble, and the nervous system prostrated ; in phrenitis and rheumatism, on the other hand, the pulse is full and bounding, and the strength less impaired. In erysipelas we have either a synocha or typhus fever, to use the phrase of Cullen, according as the eruption occurs in a robust or invalid constitution, and in the country or in a crowded hospital. It would be altogether superfluous to discuss here the progress and treatment of this form of symptomatic fever. We shall have to speak separately of its numerous modifications, in detail, as we proceed through the long catalogue of maladies of whose history it constitutes an essential part, whence the appellation Pyretic ; and we shall then lay down such rules for its

control or management, as shall seem demanded in each particular instance.

Some notice may, however be taken here, without impropriety, in a general way, of Hectic, or the Intermittent Symptomatic fever. It is not liable to be notably modified by any variety of circumstances, but preserves throughout every diversity of local connection, its specific peculiarities of character. Certain remedial measures are likewise supposed to be pretty uniformly appropriate, whenever it makes its appearance. There is, then, an advantage in stating once for all, in a condensed way, the prominent points in its history and character, the remedies most appropriate during its continuance, and the principles upon which their application must be directed. Time will hereafter be saved too, and frequent interruptions avoided, by discussing the subject now, laying down with precision for future reference the rules which are to guide us.

Hectic Fever, I have said, is in a peculiar manner the fever of irritation, and is prominently entitled to the appellation symptomatic. Yet there are weighty authorities from whom I have differed on this point. John Hunter recognizes an idiopathic form of hectic. Good quotes Dr. Percival as "subscribing," to use his own words, "to idiopathic hectic." Their reasonings and facts, however, are deficient in weight; and unless I grievously mistake, prove nothing more than their own inaccuracy or defect of observation. Dr. Percival, indeed, tells us that "he has known these idiopathic hectic to last three months, without any pulmonary affection, and then break out in the lungs." It would be necessary, to make his doctrine good, that these viscera should be proved to have been in a sound state throughout the first stages of the attack. With all proper deference for the authorities then which I have named, I must still affirm, that so far as I am aware, hectic fever never occurs spontaneously, being always preceded by and connected with an obvious cause—which cause consists in certain local disorder, usually of the inflammatory kind, and of some considerable previous duration. The local excitement from which hectic is derived, may be either external or internal; and among the seats of the latter, may be

enumerated every viscus of the body. The bladder, the uterus, the intestines, the kidneys, the spleen, the liver and the lungs—the stomach and the mesentery, have all afforded and continue to offer indefinitely numerous examples. And here we should remark a very singular peculiarity in the case before us. All other fevers, typhus, plague, bilious remittent and yellow fever, which exhibit inordinate determination to and morbid alterations of structure and function in certain internal organs, as the brain the liver and the stomach, derive many or most of their characteristic phenomena from the nature and offices of the parts thus affected; hectic alone shows no change of type, but a perfect identity of history throughout, whether it be based on bronchial irritation, abscess in the loins, tubercular disorganization of the lung or carcinomatous destruction of the uterus.

Among the internal causes of hectic, we may mention the whole class of chronic pulmonary diseases; it is thus a never failing attendant upon chronic bronchitis, upon pulmonary abscess, and upon tubercular phthisis, and it is in this unfortunate connection that you are hereafter to become most familiar with it. You will meet with it in the suppurative inflammation of all the viscera of the thorax, abdomen and pelvis—and in some chronic inflammations which do not terminate in suppuration, but in obstruction and induration; as in the tubercular enlargement of the mesenteric glands and of the pancreas.

I have not met with any instance, either in my observation or reading, of the supervention of hectic upon any form of disease affecting the brain or its membranes.

Of the external causes of hectic, white swellings or scrofulous inflammation of joints, caries and necrosis of bones, compound fractures and compound dislocations, may stand at the head of a long list of similar modes of protracted irritation; for, as it has been already observed, time seems necessary for the production of that state of system in which this type of fever shall be built up.

So many of these sources of irritation are attended with the formation of pus, that the majority of the medical writers of the last age, struck with the circumstance, have united in attributing hectic exclusively to the absorption of this fluid, after it had been poured forth in and about the diseased part. But a little atten-

tion will serve to convince us of the erroneous nature of this opinion, which is, indeed, almost absolutely abandoned. We meet occasionally with exquisite instances of this form of fever, where we cannot even suspect the existence of pus, as in chronic rheumatism, and in gouty and scrofulous swellings of joints.

These exciting causes would seem to be fully adequate in themselves, to the generation of hectic fever, without the presence of any alleged predisposition; yet there is undoubtedly a particular state of constitution in which it is developed more readily, and arises from slighter and more transient irritations. This habit of body is closely analogous to the scrofulous, if indeed, it be not, as some have supposed, identical with it. I am inclined to think, however, that it extends more widely, and comprises probably, the whole class included in the characteristic description of the phlegmatic temperament.

Hectic fever I have denominated an intermittent. This arrangement I believe to be strictly correct, although you will find the assertion repeatedly made by writers, that it is occasionally a true remittent, abating at intervals, without absolutely disappearing. This error, for as such I cannot but regard it, is founded upon an undue idea of the importance of the pulse in such cases, as a symptom. The debility and irritability of the constitution when hectic has supervened, have given rise to a continued rapidity of the circulation, which varies little from time to time—the pulse scarcely beating less than from one hundred to one hundred and twenty in a minute. Now, if the frequency of the pulse be a test of the febrile state, those are right who affirm that hectic does not entirely intermit. It is scarcely necessary, however, to remark upon the unsatisfactory nature of any such test.

Hectic fever when developed fully, presents two paroxysms in the twenty-four hours. One of these has its access two or three hours before noon. The second comes on about twelve hours afterwards—eight, nine or ten, at night. They are both somewhat irregular, as well in point of access as duration, although I have not found this irregularity so striking as it is described to be in the books. The paroxysm comes on generally with chilliness: sometimes, though seldom, there is a formed rigor. The skin is hot and dry, there is a burning heat at the soles of

the feet and in the palms of the hands, the pulse is small, but hard and tense, jerking, quick, and as has been said, very frequent—from one hundred and twenty to one hundred and sixty in the minute; there is a circumscribed spot of florid red on each cheek, the more glowing as being contrasted with the surrounding paleness of the complexion, and the eyes sparkle with uncommon brilliancy. The thirst is considerable. The tongue is for the most part, smooth and clean, but of a fiery redness, as are also the lips and the whole lining membrane of the mouth, upon which it not unfrequently happens that a light, apthous ulceration takes place. The stomach usually retains its tone, or at least, exhibits none of the more familiar tokens of derangement, the appetite being pretty good, and the digestion apparently easy and perfect. Yet it is obvious that the function of nutrition is performed in a very deficient manner. There is in all cases of hectic, from whatever cause arising, great emaciation of the body and limbs; the very nails of the fingers become adunque or bent inwards; the teeth, and sclerotica of the eye are of a pearly lustrous whiteness, owing, as is supposed, to the total and entire absorption of all the fat and oily matters deposited in the cells of the adipose tissue, and in the interstices between the minute fibres of the bony and other parts. By this imperfect nutrition too, the great muscular debility of the hectic patient is accounted for.

It has been often noted as a diagnostic or characteristic trait of hectic fever, that the spirits of the patient are usually undepressed. He retains all his cheerfulness and activity of mind, and is fond of dwelling upon the brightest pictures of days to come, which hope can present to his imagination. Such is indeed the fact, while, as has been above stated, the digestive system preserves unimpaired, its condition of comfortable sensation and elastic tone—a state of things most frequently met with where the pulmonary organs have borne the weight of the attack. But should the febrile excitement have arisen from original disorder of any of the parts of the digestive system, or should the stomach become deranged during the progress of the case, under these circumstances a far different set of feelings will have possession of the patient; his tongue is furred, and pale, and soft, his appetite variable or deficient, and he will be languid

and gloomy, hopeless and spiritless. Indeed, I regard this connection between the state of the chylopoietic viscera, and the mental condition of the patient, as so constant and regular, that I will venture to propose it to you as a diagnostic in all doubtful cases, and will declare that I never hesitate to consider the digestive system as disordered to an important degree, either primarily or sympathetically, wherever I meet with anxiety of mind, or disposition to gloom and melancholy. We can thus distinguish in an infinite majority of instances, what W. Phillip calls digestive phthisis, from true scrofulous consumption, and hepatic from pulmonary disease in general. The emaciation which is common to all these cases of hectic, I would attribute in some, to imperfect performance of the offices of the lungs, in others, to disordered or defective action of the nutrient vessels of the capillary system.

The stages of hectic are not so regularly successive, nor as well defined as those of idiopathic intermittents. The day-paroxysm seldom presents in any notable degree, the occurrence of a sweating stage, but at night the patient sweats freely. The night sweats which tend to weaken so excessively, patients in phthisis, and other hectics, and which are often termed colliquative, I would regard merely as the solution of the night-paroxysms. Whether this termination be promoted by the situation of the sick, covered up in bed, and perhaps asleep and relaxed with weariness, cannot be positively pronounced, but it seems highly probable. Hectics who do not sweat at night, will complain of great heat and constriction of the skin, and of thirst and restlessness. In a very large proportion of the cases, there will be observed but one paroxysm of hectic in the twenty-four hours. It is a matter of uncertainty which of the two will be wanting. The order which I myself have most frequently noticed, is that at first there will be a morning paroxysm for a time, after which the patient will be weak and languid during the day, but free from fever until evening. As the case approaches its termination, the two exacerbations become more and more distinctly marked. Yet this course is not invariable, for in a patient whose case I had the best opportunities of watching closely, the disease at once developed itself in the manner described, with double diurnal paroxysm.

Treatment. A few general remarks with regard to the treatment of hectic fever, may be offered in this place. The local source of primary irritation demands our principal attention. To the cure of this original disorder our remedies must be assiduously devoted, if we can discover its seat, and if the nature of the circumstances do not prohibit the hope of a cure. The knife must be employed to effect the removal of diseased parts which cannot be restored to healthy action, and which admit of being taken away. Where any obscurity hangs over the origin of the symptoms, the skill and discernment of the practitioner must be exerted to the utmost, to detect latent or internal causes of derangement which may and must exist, and to obviate or lessen their effects, or rescue the constitution from their influence. Upon these topics I cannot be expected to enter into detail at present. There are certain points, however, which will require to be attended to, and kept in view in such unfortunate cases as are met with but too often, when the primary cause of excitement neither allows of removal nor of cure. Hectic having been defined "the fever of irritation," it is reasonable to conclude that the very best remedies are such as are most aptly calculated to remove or diminish the morbid irritability of the system of the patient. For this purpose, opium has been much employed, and is without doubt, exceedingly useful; but this excellent drug is properly to be regarded as a compound prescription, exhibiting a complication of effects, some of which are disagreeable, and it may be, even injurious to the sick. Its repeated administration in crude form, in some subjects, disorders the stomach, impairs the appetite, and occasions an increase of muscular debility and languor. Much has been hoped for from the chemical modes of preparation which propose to extract the anodyne principle contained in the juice of the poppy—freed from the deleterious mixtures of narcotic, astringent, etc., and there is a degree of plausibility in the expectation. The denarcotized laudanum is really an efficient and elegant formula. Morphine and its salts are every day more and more confided in. I am compelled to say concerning all these, however, after fair and persevering experiment with them, that they do not deserve the implicit reliance which their eulogists place

upon them. I have seen from each of them, in particular cases, all the disturbances, local and general, and quite in as distressing degree, which I have ever seen follow the use of crude opium. Yet it is the fact that some one of these preparations may commonly be found, which will in each given case, answer all our purposes with little or no countervailing ill effects. Thus the first patient to whom I gave the morphine, would enjoy from it a quiet and refreshing sleep; he had been accustomed to two febrile paroxysms in twenty-four hours—after taking it, he had usually but one, and sometimes was not attacked at all. The muriate of narcotine deserves a trial. It seems to possess decided powers both as anti-irritant and anti-periodic; and, so far as I have seen, does not disturb the stomach or agitate the nervous system. With precisely similar views the spider's web has been prescribed and has received high commendation for its alleged efficacy.

The Prussic acid is, as you well know, much extolled as exhibiting a distinct control over increased or morbid irritability in general, and is of course regarded as specially applicable here. Among the names of those who report thus favorably of it, are Magendie of France, Granville in England, and Oliver and Antony of our own country—no inferior authorities. I have been able to effect little or nothing, with this agent, to the advantage of my patient. In a case of phthisis, in which I was using it, the only influence which I noticed it to exert, was in putting a check upon the night sweats, and substituting for them an intense degree of heat and dryness of skin, which the sick man declared to be intolerably tormenting.

Sulphur has been by some practitioners held in repute as a remedy generally for diseases of paroxysmal type or periodical recurrence, and from analogy, I presume, with the ordinary intermittents, hectic fever has been supposed to offer an opportunity of procuring its remedial influences. It is prescribed in doses too small to excite catharsis or sweating. I have derived no assistance from it in hectic. Similar reasoning from analogy, has induced repeated experiments with cinchona; and although you will frequently be disappointed by this admirable remedy in cases of the kind now under consideration, yet you will find it

occasionally of excellent benefit in restraining both the colliquative sweats and diarrhœa, and in restoring tone to the stomach and general system.

I prefer the sulphate of quinine in the majority of cases ; in some, however, a combination of the infusion of bark with the sulphuric acid, will be found quite as tonic, while it possesses more decidedly astringent properties.

The mineral acids are indeed in common use, and are certainly not destitute of remedial influences in the latter stages of hectic, as agreeable astringent tonics.

The metallic salts are, many of them, greatly confided in. Arsenic has been much used. I cannot take it upon me to recommend it to you. The preparations of iron, the sulphate, iodide, acetated and muriated tinctures, have better claims to our notice.

Myrrh has been regarded as endowed with some specific virtues, which adapt it to the treatment of hectic. A very favorite formula is composed of myrrh, sulph: ferri and carb: potass.

Fresh air and exercise are, however, infinitely the best tonics here. As the patient labors under great debility, it may be necessary to choose the easiest modes of gestation, as sailing, and riding in a carriage ; but if he can sit in the saddle, horseback exercise is preferable to every other.

CHAPTER XII.

SYNCOPE.

SYNCOPE is commonly arranged by nosologists, under the head of Neuroses or nervous diseases. I have placed it here, classing it among the affections of the circulatory system, on account of the following considerations. The most prominent point in its description is clearly the depression or suspension of the circulatory actions and function, insomuch, that Cullen defines it by this single character—"motus cordis imminutus vel aliquamdiu quiescens." Some of the structural derangements

of the heart, and some known influences which directly impair its power, as for example, hemorrhage, give rise with certainty to repeated fainting, but we are not aware of any defined condition of the sensorial organs with which it is connected as a regular or uniform consequence.

The proximate cause of syncope is unquestionably a "diminished or suspended action of the heart," to use Cullen's phrase. This he attributes either to organic alteration of its structure, or to abstraction of what he calls the energy of the brain. It is obvious that it may arise in three distinguishable conditions of the heart, aside from any change in the structure of that viscus. Thus, when the cavities of the organ are insufficiently distended with blood, whose quantity is diminished, either by bleeding or other discharges; when the blood admitted is not sufficiently stimulating, as from defect of nourishment, inanition; and lastly, when the heart is insufficiently excited by the sensorial energy—under either of these contingencies syncope must result.

Syncope begins usually with a sense of languor and debility, succeeded by muscular trembling, and often by nausea; there is paleness of the skin, or lividity, with general coldness and collapse of the countenance, the eyes being turned up and half closed, the lips are purple or bloodless, the nails and ends of the fingers of a blueish or leaden hue. The pulse is exceedingly feeble or altogether imperceptible, as is the beating of the heart at the side, according to the intensity of the fainting state. The respiration corresponds, being sometimes entirely interrupted, at others slow and labored, with heavy sighs and moans. There is total insensibility, for the most part, but in some persons a dim and dreamy consciousness is retained of passing events, and especially a perception of suffering and weakness. The surface, especially the forehead and upper lip, is bedewed with a cold, clammy perspiration, and at intervals there occurs a slight convulsive thrill or shudder of the frame.

After a duration varying according to circumstances, these symptoms disappear. The pulse is again felt at the wrist, the circulation is slowly and gradually restored, the wan and ghastly paleness is supplanted by the natural color of the visage, and the surface resumes its warmth. Recovery is sometimes a very agreeable process, at others it is far worse in point of suffering,

than the access of syncope. There is, not unfrequently, a sensation of profound feebleness and incapacity remaining for a good while; occasionally there is vertigo, with nausea, and even vomiting. More rarely it is attended with convulsions of epileptic appearance. I have seen them twice happen with great violence, in persons not subjects of epilepsy.

Syncope is of much more common occurrence in women than in men, and is in them much less alarming. It happens seldom to young persons or children; yet I have seen it repeatedly in a child, who began to be liable to very frequent attacks at the age of seven weeks.

The diagnosis of syncope is not difficult in general. From one of the forms of apoplexy, which somewhat resembles it—serous apoplexy, it is to be distinguished by the extreme pallor of the countenance, and the feebleness or absence of the pulse, which are more remarkable and more immediately noticeable on the invasion of syncope; the suspension or languor of the respiration is also more evident here. From other species of asphyxia, it is to be known by the bloodless state of the surface, and the cold moisture which bedews it; and better, by enquiry into the history of the case and the circumstances which produced the attack.

There is in many individuals a constitutional predisposition to syncope, which, in such persons, follows as the frequent effect of slight causes. This idiosyncrasy may be hereditarily transmitted, and thus come to prevail over whole families. There are many such examples.

The occasional causes of syncope may, I think, be arranged with propriety under three separate heads.

The first comprises the various changes in the structure or condition of the heart and its vessels, the large arteries and veins immediately communicating with it and the parts adjacent or in contact, which may mechanically interrupt or materially disturb the regularity of the circulatory movements.

We may mention here, as enumerated by authors, the ossification and earthy concretions found in different portions of the heart's structure, the valves and the origins of the large vessels—hypertrophy, aneurism, polypous formations and hydrops pericardii.

The second class of causes consists of such as depress the circulatory power, and thus impede the function of circulation by an effect more or less directly determined upon the vascular system, the organs themselves being in a natural state.

Inanition from absolute want, or from a diet innutritious or too low, emptiness of the vessels, from hemorrhage either spontaneous or traumatic, or from inordinate discharges of fluids, both natural and morbid, as in females the catamenia, and in males excessive venereal indulgences, hyper-catharsis, diabetes, etc., all belong to this place. So also the exhaustion of long continued wasting disease; and here we may best speak of such determinations to other parts, as shall leave the heart and brain insufficiently supplied with blood, as in paracentesis abdominis, when the sudden removal of the dropsical distention allows the blood to rush into the relaxed vessels, from which the pressure had for some time previous expelled it. A similar liability to fainting, frequently repeated, occurs in pregnant women, from the disproportionate determination of blood to the uterus, solicited by the expansion of its vessels. Thus, too, I would account for the frequent syncope attendant in examples of disproportionately rapid growth of the body in adolescence.

Under the third head of causative influences, I include all such as produce their effect by a primary impression upon the nerves or sensorial system generally. Exquisite pleasure often occasions fainting, in persons of very delicate sensibility, and this is especially true of certain kinds of pleasure. Some women faint from enjoyment of sweet music, some under the venereal orgasm. Still more certainly does syncope result from intense suffering, and there are certain modes of pain, which, though by no means acute, tend strongly to depress the system. A blow upon the testicle, the introduction of the bougie for the first time, may be given as instances. Disagreeable impressions upon any or all the external senses act thus, as the heat and offensive air of crowded places, unpleasant odors, and from idiosyncrasy odors not usually regarded as unpleasant; the books are full of these antipathies, as they are called, which occasion swooning at the smell of a rose, an apple, an egg, the approach of a cat, etc. Many of the emotions of the mind require to be enumerated here; joy, grief, terror, horror and disgust, as at the

contact of an ugly insect or reptile, the sight of a foul ulcer, of a dead body under the knife of the anatomist, of any striking deformity; pity; there are many who faint from sympathy at a severe surgical operation, and at theatrical representations of peculiar suffering: even impatience; "a feeling of faintness is brought on," says M. Hall, "by persevering attempts to perform certain minute acts, as to untie a small knot in silk, or to seize a very minute object with the fingers."

It is not easy to explain how these mental or nervous affections give rise to syncope. Some of them are alleged to be positively sedative in their operation, but this cannot be proved. I have already given you my reasons for the belief that mental emotions are none of them directly sedative; and of the articles of the *materia medica* to which a specific sedative influence is ascribed, not one brings on, when administered, an attack of syncope. Besides, this explanation does not, even if allowed in its full extent, remove the difficulty, for some of this class of causes are acknowledged stimulants. Cullen, with certain other pathologists, have supposed a very great and sudden exhaustion of the nervous energy to be the consequence of the application of the circumstances above recited, and the idea is highly ingenious and plausible, accounting very rationally for the greater number of the phenomena which present themselves. Perhaps, something may be properly attributed to the disproportionate determination of blood to the brain, occasioned by some of these causes, which may leave the heart unsupplied with a sufficient amount of its specific stimulus to excite duly its vital action. But these are mere hypotheses.

There are particular states of the system opposed remarkably to the occurrence of syncope. When this is observed in disease, it is spoken of as the tolerance of bloodletting, and looked upon by certain practitioners as a fair indication for the use of the lancet; its absence or the ready supervention of syncope, being proposed by Marshall Hall, as a very useful diagnostic means on this principle. Thus in phrenitis and pleuritis, it is difficult to bring on fainting by the largest losses of blood; but in certain varieties of disease which simulate and resemble them, the absence of inflammation leaves the system promptly susceptible of this ordinary effect of hæmorrhage.

Your prognosis in syncope is generally favorable. The attack seldom lasts beyond a few minutes ; the exhausted excitability, to use the language of Brown and Darwin, reaccumulates during the state of insensibility and torpor, and the ordinary stimuli of fresh air, light, sound, etc., are sufficient to excite the patient into new life, or he recovers, as the phrase is, spontaneously. There are, however, on record, notices of cases in which no alarm being felt for the result, no exertion was made to restore the subject, until too late. These, though rare, I mention to impress on your minds the impropriety of neglecting any patient in this situation. The interruption of any vital action should be regarded with some anxiety. The animation which is only suspended, may, if suspended too long, be irrevocably lost ; the heart, if allowed, for want of the requisite excitement, to remain too long inactive, may never, never, beat again. It seems reasonable to suspect that many of the cases reported as "simple apoplexy," where sudden death has occurred without cerebral or other lesion, are of this nature. Perhaps we may place here too the fatal insulations—or at least some of them—described so well by Dowler, of New-Orleans,—congestion of the lung and fatal sanguineous engorgement being the result of syncope ; the heart ceasing to act first, and the large thoracic vessels yielding to the consequent distention.

Treatment. With respect to the first class of cases of syncope,—those namely, which depend on some organic affection of the thoracic viscera, I have little to say. In the present state of our science, we have not much to hope under these lamentable circumstances. To alleviate the sufferings of our patients, we must enjoin the careful avoidance of every thing that disturbs the circulation, or forcibly excites the nervous system. Low diet should be advised ; rest and tranquility, mental and physical ; digitalis has been found useful. Revulsion should be effected by the application of blisters to the chest or arms, or the insertion of a seton or an issue in the surface of the thorax near the chest, or on the inside of the arms. We may distinguish these unhappy cases by exploration of the thorax with the ear or stethoscope ; and by remarking that the symptoms which they present, although they may be mitigated at one period and aggravated at another, never intermit or go off entirely, and are

surely renewed by muscular exertions. Between the recurrences of syncope (when they are attended with fainting) there will be palpitation of the heart, with irregularity and intermission of pulse.

The cases which you will meet with much the most frequently are of the second order—arising from inanition, loss of blood and inordinate discharges. Your patient must be immediately placed in a recumbent posture, with his head low. This position, instinctively sought on the approach of syncope, allows of a free passage and forcible propulsion of blood to the brain—which is supposed, in this condition of things, to be, like the heart, insufficiently supplied and imperfectly excited by a current too feebly impelled along its vessels. Its effect seems to me more general than this; by neutralizing, so to speak, the influence of gravity upon the sanguineous fluid, it tends to render more effective the action of the heart both upon the arterial and venous columns; the latter of which, especially, depends for the continuance of its vital movements upon the powers of the great central organ. To startle the respiratory muscles, dash cold water in the face; irritate the nostrils by ammonia, etc.; give some stimulating drink, hartshorn, æther, brandy, apply warmth to the extremities; chafe the surface of the body. The fit continuing, lay hot sinapisms or turpentine to the extremities, and resort to any other such means as may be at hand, of making a prompt and forcible impression upon the system. Of all these, electricity and galvanism, if they are within reach, would undoubtedly prove most efficacious. Prepare some warm nutritious fluid to sustain the vaccillating powers of life, as soon as the patient can swallow.

The transfusion of blood has been performed with good effect, when the fainting state has been produced, by large losses of blood as in puerperal hæmorrhage.

In such attacks of syncope as result from the third class of causes—those which act primarily upon the sensorial system, your practice will require to be regulated by the history and circumstances of each individual case. When produced by the intensity of mental emotion, under the influence of the more stormy passions, whether joy, terror or grief, it seems to approach very closely the character of some of the forms of apoplexy—

from which, indeed, Senac and others seem to think it would be difficult to separate it pathologically.

The diagnosis however is more embarrassing than the question of treatment. The disproportioned determination of blood to the brain—to which the defective excitement of the heart has been attributed—requires a prompt resort to every means efficient in setting again in motion the stagnant fluids and equalizing the vascular distribution. Cold water must be poured with force upon the face and head, while heat and other quick irritants are applied to the thorax, epigastrium and extremities. Antispasmodics have been highly extolled here—assafœtida, castor and musk are used. Ammonia may be applied to the nostrils. A certain degree of caution is to be observed in regard to the employment of internal stimulants. Recovery, under these circumstances, is apt to be attended by an unsafe degree of reaction, which must be counteracted by judicious management of the patient, morally as well as physically. Even the lancet may become necessary, when the beating of the heart is restored; and in this state of renewed consciousness, immoderately excited by the return of vehement passion. If the syncopic state be one difficult to be understood, not less obscure is the recuperative condition, where the resumed activity of the organs is productive of so much distress and irritation; as we see in the occurrence of vomiting, vertigo, and even of frightful convulsions.

We seldom find any of these violent consequences follow fainting, which has been produced by feelings of mere sympathy, pity or disgust. These emotions are of less intense character—less impressive than the class already spoken of, and their physical effects are uniformly, or almost invariably less violent, and rather more transient in duration.

The recovery from syncope is for the most part complete, and requires little attention. The patient should not rise too soon or abruptly from his recumbent posture, but indulge himself by remaining at rest. If, after a few hours, there should persist any confusion of ideas, vertigo, tinnitus aurium, or other marks of too great determination to the brain, they will be removed by a light purgative.

To prevent the recurrence of fainting fits in subjects constitutionally predisposed, is no easy task. It is of paramount impor-

tance, that they should avoid all exposure to the influence of such agents as their experience has shown to be capable of bringing on an attack, all, or most of which, have already been enumerated.

With a view to do away or diminish the mobility of fibre, upon which these causes act, we should have recourse to tonics. Of these, the metallic are generally preferred. The muriated, and acetated tinctures of iron, have seemed to be well-adapted. Arsenic is also useful. The vitriolic elixir has been much employed. Bark and camphor have their advocates. In cases of obvious general debility, the moderate use of wine, with a full and generous diet, should be allowed. The cold bath, sea bathing especially, has been found highly efficacious in restoring the tone of the system.

But, above all tonics, you will recommend exercise in the open air. Proportion it to your patient's strength, taking care always to stop short of fatigue. Sailing or riding in a carriage will suit best, if he continue feeble and languid; but when the saddle can be borne, horseback exercise is infinitely preferable to either.

CHAPTER XIII.

ANGINA PECTORIS.

THE nature of this painful and distressing affection is so obscure, that nosologists have found considerable difficulty in deciding where it should be located. I have fixed upon the propriety of classing it among the disorders of the circulatory system, for reasons that will appear as we proceed in the description of the disease.

In the uncertainty which has prevailed concerning its intimate nature and proximate cause, each writer who has treated of it, has employed a name or denomination referring significantly to his own particular views of the subject. Thus, it is

called by some Syncope anginosa, to express its supposed analogy in certain points, with common syncope or leipothymia; and thus, Darwin, dwelling emphatically on the dyspnœa which forms so prominent a symptom of it, has styled it "*Asthma dolorificum*." Good has conferred upon it the title of "*Sternalgia*, or breast-pang,"—a term as free from objection as any other, on the ground of its being inexpressive of and unconnected with any hypothetical notions concerning its Pathology, and intended merely to bring forcibly to the attention the most annoying and uniform circumstance in its history—the pain at or under the sternum. I have, for a similar reason, adhered to the original name applied to the disease, which alludes simply to its locality and painful character.

Angina pectoris is seldom or never met with before the middle term of life. It is of the paroxysmal or recurrent form—is not, however, governed by any definite periodicity in its intervals—after the few first attacks, is disposed to become fixed in the constitution with the tenacity of a habit, invading with apparent independence of the causes which at first seemed necessary to give rise to it.

The earlier attacks are sudden, and entirely without premonition; they come on when the patient is engaged in some considerable muscular effort, under circumstances which may embarrass his respiration, as in ascending a steep acclivity, or a stair, or walking against the wind; after the paroxysms have been repeated, they are brought on by very slight exertions, and at last invade spontaneously even when he is at rest. At first, they are of short duration, ceasing when the muscular action which produced them is suspended, as by standing still, turning from the wind, or sitting down; when it has become spontaneous or chronic, they may last an hour, or even more.

The patient is seized with pain of extreme severity, shooting across the upper or middle part of the sternum, and extending down the arms half-way between the shoulders and elbow; the left arm is most commonly thus affected, but sometimes the right, and occasionally both; in succeeding paroxysms, this pain extends to the wrist, and even to the very ends of the fingers. There attends, at the same time, a dreadful sense of suffocation, with oppression and constriction of the chest, and

an overpowering fear of instant death. The countenance is pale, the breathing suspended, or hurried and irregular. The pulse differs very much, there being, as I shall point out, two separate and well-defined classes of cases; in one of which, it is full and hard, varying in point of frequency, sometimes hurried, and at others slow or intermittent, and occasionally altogether undisturbed.

In subjects affected by the chronic form, and in a few instances from the very first, it is apt to be contracted and oppressed, faltering and feeble. Inattention to this striking discrepancy in the state of the circulation, has given rise to exclusive and erroneous views in practice.

I have said, that after a few repetitions, the paroxysms are brought on by the slightest muscular exertions, as by coughing, loud talking, vomiting, straining at stool, until finally they invade spontaneously without any obvious cause; it is said, that they are much more likely to recur when the stomach is distended by a full meal.

The general Prognosis is unfavorable. A majority perhaps survive, the disease assuming an habitual character, and allowing time for the application of our remedies, which, if employed with assiduity, perseverance and fortitude, may be ultimately successful in its complete removal, and, at any rate, promise very notable alleviation of suffering. But, in a very large proportion of the subjects, sudden death is occasioned by the violence of one of the early paroxysms.

The Pathology of angina pectoris, is exceedingly obscure. Post mortem examinations have hitherto failed to throw any strong light upon the proximate cause or morbid condition upon which it depends; let me say rather, that they have revealed to us so many and such varied changes of structure in bodies dead of it, that we are quite at a loss to distinguish between essential and incidental lesions, and unable to decide whether the derangements discovered, are not rather the coincident effects, than the sources of the diseased actions which constitute this strange malady. Thus, the coronary arteries of the heart have been found ossified—so have the valves—hypertrophy, both concentric and eccentric, etc. etc., but none of these alterations are constant or unvarying.

My own opinion of the nature of angina pectoris, is, that it is a functional affection of the heart itself, neither dependent upon a disordered state of the stomach, nor on a gouty diathesis, as Butler, McQueen, and Chapman have taught, nor upon simple vascular plethora, as maintained by Hosack, although each of these contingences must be acknowledged to be among its efficient predisposing and occasional causes. Nor do I admit of its being necessarily connected with any organic change in the structure of the heart or of its vessels, an opinion ably advocated by Parry among others, though, as I have stated, it is found to be, in certain subjects, coincident with the presence of such changes.

I found this view of the Pathology of angina, upon the occurrence of cases, in which, upon dissection, no morbid alteration of any organ or part could be discovered. All other muscles are subject to cramp or spasm, and there can be no reason alleged, why the heart should be exempt from this general liability, and all my patients have pointed to the cardiac region as the principal seat of suffering, making use of the word spasm as the best adapted, by analogy, to convey an idea of the nature of the agony they endured. That the diaphragm is also thrown into a sympathetic state of spasmodic contraction, seems highly probable from the history and symptoms of the attack.

Treatment of Angina Pectoris. This requires obviously to be divided into, 1st., a discussion of the means of relief demanded during the paroxysm, and, 2nd., a recital of the plans proposed as adapted to ward off an attack, and remove the liability to a recurrence of the disease.

During the paroxysm, if the pulse be full and hard, we must resort immediately to venæsection, which should be large and effective. It is rare, indeed, that the lancet is not called for in the early paroxysms, and while the patient retains any degree of strength and vigor. Dr. Hosack's opinion of the connection of angina with a general plethora of the system, has been already alluded to. Whether the concurrence be fortuitous, I will not pronounce, but it has happened, that with few exceptions, the cases which I have met with, have been in persons whose figure, corpulence, and habits of life, have strongly predisposed them to apoplexy and paralysis.

In one patient, to whom I have been repeatedly called, an attack of apoplexy supervened while he was struggling in an accustomed paroxysm of angina, which had come on when he was rising from bed in the morning. I arrived promptly, and instituted a course of most energetic depletion. He recovered with hemiplegia, the paralysis not prohibiting his making an imperfect use of both his upper and lower limbs; and, so far as I know, has had no recurrence of angina since that time.

It is certain that the lancet is our most impressive and ready means of obviating the ill-effects of plethora, either local or general, when urgent and impending, although, you should always remember, it is only of temporary advantage, and by no means allows of indefinite repetition in its employment. I do not direct you to its application in every case, mechanically or promiscuously, but merely to such as are attended with firm pulse, general vascular fulness, and danger of organic injury, as above indicated; and such have usually fallen under my own notice.

But you should be aware, that a considerable proportion of instances occur under a set of circumstances directly contrasted and opposite. Misled by his own observations, which would seem to have been limited to this class of cases, Marshall Hall has incorrectly enumerated among the diagnostics of angina pectoris, "a pulse feeble, faltering and irregular." Here you will of course modify your practice in relation to the condition of your patient. It is in these subjects, that sudden death is to be dreaded; and the impending catastrophe can be averted only by the most decided and hasty impression on the system by the highest order of diffusible stimuli—æther, brandy, camphorated spirits, the volatile alkali, either of which may be administered in large dose, the most convenient being, for that reason, preferable.

No time should be lost in aiding their effect, by the application of the most powerful and ready counter-irritants to the surface of the thorax and to the extremities. Cloths wrung out of hot water, hot spirits or hot turpentine, should be laid to the chest and to the wrists and ankles, while we persevere with the internal administration of the most active stimulants, hot toddy,

with or without laudanum, in free doses, brandy, in which pepper and spices have been infused, etc.

An emetic has been recommended by Good. I have never seen an attack in which there was time or opportunity for its administration. It might be useful to empty the stomach of an undigested meal, or of any other crude and irritating contents.

Purgatives are also spoken of, but I must avow, that I cannot understand their utility in a moment of such urgent need. I would administer an irritating enema, if it could be done without delay. The affusion of cold water is proposed by Frank and others. If proper discrimination be made in its employment, I should expect some advantage from it. I should consider it adapted to the same plethoric subjects who require the lancet, but I would restrict it to the head and face.

The treatment in the interval is of no less importance, and demands our particular attention. It becomes our duty to examine closely into the apparent and probable causes which have given rise to the disease. In those unhappy cases in which it is connected with or sympathetic of organic derangements of the heart, we can only hope to effect some alleviation of suffering. We must enjoin quietude, restrict the patient to low diet, and inculcate the avoidance of all excitants, whether moral or physical. Something may be done by the use of digitalis and other narcotics, employed in such dose and manner as to curb the irregular actions of the disturbed organ, and by the occasional relief of moderate blood-letting. I should be very much disposed to make a fair trial, under these circumstances, of the Prussic acid, in some of its concentrated preparations, and in cautious, but efficient amount.

Where the digestive function is deranged, we must direct our efforts to restore that system to its proper tone and correct action. Alterative doses of mercury may be serviceable, especially if combined with gentle and regular purgatives. Such tonics as seem best adapted, should be perseveringly employed. The salts of iron, bark, and the bitters, with aromatics, have been used with good effect.

In a gouty patient, for as you are aware this combination has been much dwelt on, we must strike at the arthritic predis-

position. In cases of this kind, the tinct: of guaiac: we are told, has proved exceedingly serviceable, especially if it keep up a steady action upon the bowels. Here also colchicum promises to be useful. When dependent upon, or, as I would prefer to phrase it, associated with, a plethoric fulness of the vascular system, we must place our chief reliance upon the observance of the strictest regularity, temperance, and habits of exercise. Indeed, under all the various undefined modifications of cause and of constitution, the best general treatment of chronic disease, and the most successful, is that which regulates most exactly the regimen and conduct of the patient.

The dilatation of the heart, and the softness and flaccidity of its muscular fasciculi in some autopsies, have given rise to the conjecture, that in these instances, at least, the disease consisted in a weakness—a loss of contractility in the cardiac fibres, which rendered them incapable of propelling the blood with force sufficient, especially under the additional demands of muscular action. Any measures, then, which will tend to diminish the mass of blood without subtracting from the strength or tonicity of the muscular fibre, must evidently be serviceable to the patient.

You will, perhaps, think it inconsistent, that I should recommend exercise as a remedy, after enumerating it among the principal exciting causes of the paroxysm. It is easy to ascertain what modes and degrees of exertion are injurious, however, and these should be carefully avoided. There are very few instances, indeed, in which passive motion—the several exercises of gestation, are not well borne, and indeed highly beneficial. Sailing, and riding in a carriage, are the easiest of these. Some bear the saddle well, and to such, horseback exercise is most useful. A severe case is related by Marshall Hall, in which the patient could easily sustain the shaking on horseback, although he suffered an immediate attack of pain even on the mere attempt to raise himself in his stirrups.

Among the most efficient of our remedies, we must arrange the several modes of permanent counter-irritation—issues, and setons, and perpetual blisters. These may be placed on the chest, the arms, the thighs, the wrists and ankles. They may be made by moxibustion, by the use of nitric acid, or in any

other of the usual modes. I prefer the irritation of repeated blisters, putting them alternately upon the thorax near the heart, and upon the upper part of the arms, on the inner side adjacent to the insertion of the deltoid. To do any good, these plans of counter-irritation must be persisted in for a length of time. It has been suggested, that during their employment, we may find it beneficial to suspend them for a short interval occasionally, resorting in the meanwhile to topical depletion by leeches, or cupping the back of the neck or the thorax, and it seems to me to be likely to do service, if there be no objection to the loss of blood in this mode.

Having no confidence in the efficacy of what are called specific remedies for angina, I have laid no stress on them. I may mention here, that cures are reported to have occurred under the exhibition—with this view—of Fowler's arsenical solution—of the sulphate of zinc—of the carbonate and sulphate of iron—of the nitrate of silver—and of belladonna.

I had rather impress upon you, in conclusion, the importance of a persevering enquiry into the causes which have produced, and which tend to render permanent, this distressing malady, that you may institute such measures as are adapted to their removal, or the diminution of their evil influence, thus pursuing a rational *methodus medendi*.

CHAPTER XIV.

HEMORRHAGE.

A SPONTANEOUS flow of blood is a frequent, if not an essential symptom of many diseases or forms of disease. It occurs also independently of other affections, constituting a serious and occasionally a fatal malady, and requires, in either point of view, our close attention. I have preferred to discuss it under the present head, because of the pathological uniformity of the conditions presented in the various localities which it affects. It is

always referable directly to a morbid state of the vascular system ; is rarely, if ever, a mere local disorder ; and in general, is obviously connected incidentally with the part in which it may take place.

What may be the first link in the chain of diseased movements which shall eventuate in Hemorrhage, is, however, far from being distinctly known. The flow of blood is an effect ; we know not, at least in an infinite majority of instances, the primary cause. One intermediate condition is, as I have said, uniform ; but it is not exclusively characteristic: hyperæmia, the inordinate determination of blood and its disproportioned afflux into the vessels whence it is to issue, exists also in inflammation. It is in both instances alike, the consequence of either irritation or congestion ; but what determines or develops inflammation, on the one hand, and hemorrhage on the other, is yet to be discovered. Nor is the mode of escape, the manner of outlet found by the vital fluid, uniform in cases of hemorrhage. At times, we have actual rupture—solution of continuity either by laceration or erosion ; but this mode, which in former times was considered general or universal, is now known to be the rarest form of hemorrhage.

2d. Again, we meet with hemorrhage from surfaces entirely unbroken, absolutely sound, exhibiting on the most careful examination, either no change at all, or if any, a mere injection of the vessels or a thickening or softening of substance, similar to what are seen in ordinary inflammations.

3d. Again we have, as in scurvy and purpura, and at the termination of some of the malignant fevers, a notable change in the crasis or condition of the blood itself, which seems thin and dissolved, and ready to ooze through all the vessels that contain it.

In the second of these classes are included most of the hemorrhagies properly so called, and to these—though we must not neglect the first and last varieties, our reasonings on the subject will be found specially to apply.

Effusion of blood in any large quantity, is a very alarming disease, or symptom of disease ; but in general, is less fatal than terrifying. Syncope is apt to ensue promptly in proportion to

the suddenness of the occurrence, both because of the moral and physical influences exerted. Fear may quickly diminish the force of the heart's action; and the fainting state, which every loss of blood has in itself a tendency to produce, gives opportunity for the formation of a clot or coagulum, in the opened vessel or upon the bleeding surface, which may restrain the tendency to its recurrence in slight cases, and such as are dependent upon transient agencies. Hence you will immediately infer the propriety of permitting the patient to remain awhile in this fainting state, and the injudiciousness of the efforts so often made to rouse him hastily by stimulants, in serious hemorrhage.

Hemorrhages have been divided into the active and passive; and this distinction may be retained, premising an explanation of the terms, which refer, as it will be shown, to the general condition of the patient, rather than to any local circumstances connected with the effusion of blood. Cullen, after Hoffman, regards hemorrhage as an affection essentially pyretic, and has indeed arranged it as an order (IV.) under his first class *Pyrexia*. Others consider this pyretic character as belonging only to the active hemorrhagies, and admit the existence of a class which they denominate passive, as being free from combination with fever. To avoid any confusion in this matter, Good has substituted the terms *entonic* and *atonic* which I think ought to be preferred, as expressing more distinctly the reference to a general or constitutional condition of the subject. The first, or *Entonic* hemorrhage, takes place when the system of the patient is at the ordinary condition of strength, tone or vigor; the second, or *Atonic* hemorrhage, when it is below this point, and in an enfeebled state of general health.

I need not say that I neither admit the correctness of Cullen's view of the nature of this disease, nor of the distinction first quoted. I have frequently seen active—*entonic* hemorrhage—occurring in full and robust patients unattended by any febrile appearances; and on the other hand, have often had melancholy occasion to witness passive—*atonic* hemorrhage—in the latter stages of fevers, both idiopathic and symptomatic, as in yellow fever and hectic.

The occurrence of fever, when it comes on consentaneously

with hemorrhage, seems to me, at least in an infinite majority of cases, merely accidental, taking place only as a coincident effect of the same cause which has determined the flow of blood.

Even in the pyretic hemorrhagies, it is indeed wanting, for the most part, at this earlier period, and supervenes afterward in the passive, as well as in the active forms, from that degree of irritation which is the almost inevitable consequence of so great a disturbance as is thus created in the functions, and of the increase of mobility and irritability of the nervous system, which ensues in the weak and exhausted state of the patient.

I have said that hyperæmia is a condition of the vascular system, or some part of it, invariably connected with or antecedent to the occurrence of hemorrhagy. You will doubtless recollect my having taken occasion to dispute the assumption of the existence of a general or universal hyperæmia; I will not repeat here what I then said on the subject. It will suffice to suggest, in this place, that even if we acknowledge a general hyperæmia as the cause of hemorrhage, we must give some reason why the effusion should be determined to escape from the particular organ or tissue affected.

This afflux must constitute a local hyperæmia, in every instance—a disproportioned, or undue determination of blood to the part, disproportioned not to any supposed absolute amount, but to the capacity of the vessels forming the tissue or organ. By the supposition of a general hyperæmia, we account for none of the phenomena.

This word, you are aware, has been, in recent times, and chiefly on the authority of Andral, one of the most illustrious of modern pathologists, substituted for the ancient term *plethora*.

Plethora, universally received among the old writers as the principal predisposing cause of hemorrhagies, was divided by them into several forms, and the learned Dr. Parr has of late made an ingenious endeavor to revive the distinction and its practical application.

1. "*Plethora ad molem*" contemplated the absolute superabundance of the vital fluid—a true hyperæmia in the general or universal sense. 2. "*Plethora ad spatium*," its quantity in reference to the contracted state of the vessels. 3. "*Plethora ad volumen*," referred to its own supposed expansion. And lastly,

"Plethora ad vires," a quaint phrase, alluding to that state of the body in which the mass of the blood, and the force with which it was circulated, were disproportioned to the tone of the containing vessels, their tenacity, their power of resisting the impulse incessantly acting on their distended fibres.

I will not deny the existence of any but the first of these conditions. The second may be met with in well marked congestive cases of disease, and inferred to be present whenever the pulse is, according to our former definition, "oppressed." The third is frequently observed in spring, when the returning heat of the season acts on the fluids of the body, for we cannot imagine them to be exempt from the universal law of expansion by increment of temperature. Hence we have at this time, and in early summer, numerous headaches, and if the thermometrical range is high, insolation, apoplexies, as well as the more obvious hemorrhagies in subjects predisposed to them.

What then is this predisposition—what is plethora? It is impossible to be satisfied with any answer that shall refer merely to the absolute quantity of the blood to be found within the vessels of a living body. Something else, essential and characteristic, is implied, and must be present. If we are permitted to reason backward here, from effect to cause, we shall find in almost every case of hemorrhage, if not universally, an obvious degree of laxity of the general fibre, the probable consequence of an imperfect elaboration of the nutritive particles deposited for the purpose of supplying the demands of the several tissues, and balancing the waste or wear of the solid portion of the frame. After all, however, we must acknowledge the great uncertainty and obscurity of the nature or proximate cause of plethora. Its remote causes we know much better, quite well enough for all practical purposes.

Plethora is the disease of civilized, of refined life. It is the ultimate result of a variety of circumstances which act scarcely upon any but the sedentary, the indolent, the luxurious. It haunts the work bench, the manufactory, the village, the city, the desk of the student and the table of the sensualist. Wherever the terms of the original curse on the first gardener are fairly enforced, and man earns his bread by the sweat of his brow in the free sunlight and the fresh air, it is unknown. The

industrious ploughman, the hardy sailor, the enterprising traveller, are safe from it. But where light, or air, or abundant exercise are denied, the organs of digestion lose their capacity, the assimilation of food is imperfect, the physical powers decay, the solids are of deteriorated consistence and become relaxed, the circulating fluids defective in vivifying and nutritive quality are yet undiminished in quantity, and are propelled, especially under any exciting influences, with a force disproportioned to the elastic or contractile powers of the containing vessels.

Hence arise many diseases besides hemorrhage; for this plethoric state has long and truly been regarded as the fruitful parent of evils. Hence are inflammations—a dreadful train, glandular obstructions, and hypertrophies whether analogous or heterologous. You must not, however, confound plethora with obesity or corpulence, a condition doubtless full enough of its own inconveniences, but very different from that which I have been describing.

The essential point in the case under discussion, is the disproportion on which I have dwelt. No matter how moderate or how deficient the absolute amount of circulating fluid, no matter how reduced the subject may be, if this quantity and the force with which it is moved be too great for the strength of the vessels, your patient labors under plethora. Indeed a large majority of the instances that have come under my care, has been among men and women of thin and spare, if not emaciated habit; and Sir Gilbert Blane, in his investigations of the statistics of apoplexy, so often a hemorrhage in the brain, found the greater number of attacks to take place among the poor.

I know of nothing which distinctly informs us of the existence of a plethoric state of the system previous to the first occurrence of some hemorrhagic effusion, and on subsequent occasions the return of such symptoms as may have immediately preceded the flow of blood, and hence give reason to dread its repetition. These symptoms will, of course, come more particularly under our consideration, when we go on to speak of hemorrhages under their separate heads; we may now remark generally, that they consist in certain sensations of weight, heat, throbbing, fullness, tension, or pain at or near the point from which blood is about to issue.

These, you at once perceive, are the very phenomena which concur in the description of inflammation, and the recital might seem to give ground for the inference that the pathological conditions of the two are identical; but upon reflection, you will notice that they are all referable to the simple and ultimate fact of the existence of an undoubted hyperæmia in both cases.

All these unpleasant sensations thus alluded to, as they depend upon the presence of an undue amount of blood in the vessels of the part affected—a congestion either active or passive, are at once, and for the most part, entirely relieved, when a sanguineous discharge takes place, whether it finds an outlet by rupture of a vessel, or as in general by exhalation, to use Bichat's phrase, by exudation or diapedesis. Hence arose, plausibly enough, the ancient opinion that hemorrhage was the result of an effort of the *vis medicatrix naturæ*, that it was a salutary and remedial process, efficient in the prevention of some threatened evil, or in the cure of some present malady. It followed that many losses of blood came to be considered critical, and one of the nicest applications of our art was deemed to be the imitation of this natural remedy, and its precise application in point of time. Nay, as it was difficult to distinguish between those hemorrhages which are truly critical and salutary, and those which were morbid and hurtful, there arose in the minds of physicians, a dread of interference generally, and a disposition to let such cases alone, as dangerous to tamper with.

These positions, I need hardly tell you, are far from being established. On the contrary, I regard them as entirely fallacious, and calculated to lead us, on the one hand, into an erroneous mode of practice, or on the other, to a fatal dependence upon the powers of nature. I will not deny that relief from certain troublesome symptoms is afforded by certain hemorrhages. I will acknowledge that when they take place from the vessels of unimportant parts, they are occasionally of much advantage, and deserve to be looked on as far less evils than those of which they are the substitutes; nay more, they are sometimes on the principle of revulsion, very usefully remedial—as for example, where cerebral disorder is relieved by epistaxis or hemorrhoids. But it does not follow from all this, that hemorrhage is to be neglected or regarded with indifference. It is in itself, under

all circumstances, inconvenient and annoying. It gives but a transient relief, even when best adapted to the removal of previous disease. By its continuance or repetition, it establishes a perpetual determination to the surface or organ from which it issues. It unfits such tissue for the performance of its physiological functions. I need not enlarge upon the direct injury it occasions, in deteriorating the quality of the vital fluid, and impairing its nutritive and stimulating properties. Sanguification becomes more and more imperfect, the proportion of fibrine and red globules lessening, and the serum and watery parts increasing. The tone of the living and acting fibre is diminished, the sensorial system thrown into extreme disorder, the whole organism deranged in its movements and hurt in its capacity for action, and either atrophy or fatal dropsy supervenes.

In our treatment of hemorrhagy, it will be found necessary to view it as one link in a chain of morbid circumstances,—by no means, except in some rare instances, to be considered alone or as an insulated fact. Like other morbid affections, it will disappear if its cause be removed, and it behoves us carefully to investigate its causes. I have already confessed that these are often obscure and ill understood. In the examination of the surfaces which have yielded fatal hemorrhages, as in hemoptysis and intestinal bleedings, it has been remarked by numerous authorities, from Morgagni down, that nothing can be detected to explain or account for the occurrence. The mucous membrane is often unimpaired; it is sometimes paler than usual, sometimes redder, sometimes a little softer to the touch, or a little thicker. In epistaxis, no change has ever been noticed, so far as I am aware, In scurvy and purpura the gums become spongy and dark colored. but often bleed freely without erosion. In the hemorrhagic stage of malignant fever, there is no lesion of the surface of the mouth, tongue, etc. The membrane usually assumes an intense red hue, but I have an hundred times satisfied myself of its entire integrity. This is easily done by wiping off the blood as it oozes; a magnifying glass will show many minute points from which the fluid escapes; but the flow will often intermit, the appearance remaining unchanged.

Autopsies now and then reveal erosions and lacerations which have produced hemorrhage. The former occur more

frequently in the mucous membranes, as of the lungs and bowels, the latter in the brain; let me impress upon you, however, their comparative infrequency as sources of hemorrhage.

In the discussion of the general management of the disease, which is, of course, all that is proper under the present head, we must pay special attention, in the first place, to the avoidance of its exciting causes; and, in the second, make every effort to remove the predisposition on which these causes may act.

The occasional causes which give rise to hemorrhage, are numerous. They will be found to comprise all the circumstances, which shall, on the one hand, increase the force of the circulation, and, on the other, determine specially this force or afflux to particular parts. As examples of the first, we may mention all violent muscular exertions, such as running, lifting weights, leaping—passion or mental emotions vehemently aroused—all stimulants; of the second, exposure to cold and sudden alternations of temperature, diminution of atmospheric pressure, as at great heights—external violence—inflammation of any organ or tissue—improper postures—the use of ligatures unduly applied so as to retard venous circulation—exclusive or disproportioned employment of certain organs, as among goldsmiths, musicians, etc.

Writers make a distinction between arterial and venous hemorrhagies. In early life the former are said to be most frequent, in more advanced age the latter; and the explanation of this difference is ingeniously derived by Cullen from the fact ascertained in the experiments of Sir Clifton Wintringham—that the proportional density “of the coats of the veins to that of the coats of the arteries is greater in young than in old animals.”

Each of the individual hemorrhagies seems to be specially incident to a given period of life; thus in childhood and youth we have epistaxis; at the time of puberty and in early manhood hæmoptysis; after maturity, intestinal bleedings, hemorrhoids, menorrhagia, apoplexy. Particular constitutions exhibit a continued tendency to hemorrhage; thus children who have been notably liable to epistaxis, are also apt to become the future subjects of hæmoptysis. There are also hereditary predispositions to all the forms of hemorrhage, and these predispositions whether they depend on obvious malformation of parts or on the succes-

sion of more obscure morbid peculiarities, are so powerful in their tendency that to escape or evade their efficiency requires the nicest attention, the greatest skill, and the most unwearied diligence.

In this connection I must not omit to speak of what are called vicarious hemorrhages. These form a class of very curious and interesting phenomena; they are usually met with where any one of the natural secretions or excretions is wanting, whether from obstruction or defective action in the organ supplying it, and supposed to be a sort of substituted outlet for such discharge. They occur almost exclusively in females, and attend upon cases of obstinate amenorrhœa, or as is affirmed, of dysmeuorrhœa. They take place most frequently from the lungs, stomach and nostril. Dr. Finley, of this city, relates an instance of hemorrhage from the mammæ; and stories are found in your books of its issuing from the finger, the foot, or any point indeed, of the internal and external surfaces. In a case under my own care, of extremely defective and difficult menstruation in a young lady, there was repeatedly a slight discharge of blood, preceded by a vesicular eruption from which it issued, upon that portion of the skin of the cheek directly beneath the eye, which in so many females assumes a somewhat darkened hue during the monthly period.

No very striking peculiarity of management seems to be required in these cases. While we resort to the means best adapted to obviate the pressing evils which may arise in the impairment of the functions of organs thus vicariously affected, we must not neglect to apply the proper remedies for restoring the natural and regular secretions or discharges.

The most important circumstance in the history of hemorrhage, is its tendency to recurrence. This recurrence may be either irregular, or as is well known, periodical. It is easy to understand how the rupture of any blood vessel shall occasion a comparative weakness of that vessel. It is also clear, that vessels which have once yielded to distention, whether by active or passive congestion, and have been relieved by exhalation, no matter what meaning we may attach to that term, shall yield more readily on a repetition of the afflux and distention. Blood may either escape from the orifices which gave vent to the natu-

ral secretion, (such as the mucus from mucous membranes,) distended by forcible determination, and debilitated by local disease or loss of contractility; or it may transude through the panietes of the vessels under influences not easily intelligible, but dependant on an impairment of its own vitality, or of the vital tenacity of the vascular tissues. If the first attack depended on a permanent condition, such as any malformation, any peculiarity of minute structure, any hereditary taint, or upon circumstances that are repeated or continue to exist, such as perseverance in the same occupation, amusement or mode of life, it is evident that a second will be more readily brought on, and thus a morbid habit be firmly established.

The periodicity of hemorrhages is a fact as obvious and undoubted as that of other diseases, and no less difficult to account for. While the majority of medical writers confess their ignorance of this matter, and content themselves with a reference to the universal disposition exhibited in the animal movements to a periodical revolution, there are others who boldly ascribe the phenomenon to lunar influence, and maintain the direct correspondence of the returns of hemorrhage with certain phases of the moon. Among these, the principal are Mead and Moseley, the latter of whom has related more than one case strongly confirmatory of the doctrine.

The general remedies for hemorrhage may be arranged into two classes, as applied in direct opposition to the occasional causes or modes of causation. The first consists in mere abstraction, by which we diminish the force of the circulation, and lessen the impulse of the fluids in motion. Rest in a recumbent posture, silence, darkness, absolute diet, cold, venæsection, purgatives and other evacuants, and the whole catalogue of supposed sedatives, nauseants and narcotics—these are the most influential, and may all be employed in turn, or combined so as to act promptly upon the system. It is obvious that they are applicable specially, if not exclusively to the entonic hemorrhages. The second class of remedies comprise such as are revulsive in their operation, creating new determinations, and changing as promptly and thoroughly as may be the points of afflux. Local irritants, such as mustard, blisters and the like, active stimulants of particular surfaces, as salt, emetics, and some

purgatives to the digestive mucous membrane, are obvious examples. Less direct, but still very effective in the same way, is venæsection, both general and topical, and the sudden impression of cold applied to the skin.

The next, and a very important indication to be attended to, is the removal of the predisposing cause—the defective state of the constitution already described, and well known as plethora. How shall we treat plethora? in other words, how prevent the hemorrhages of which it is, if not the exclusive, the fruitful parent? I answer, not by venæsection, nor by low diet, though these with the other means of abstraction and revulsion, have been already recited to you as essentially necessary for giving immediate relief and obviating impending and pressing evils. Let us aim rather at restoring the tone of the relaxed solids, than at the mere diminution of the mass of the animal fluids. Let us employ our best efforts to renew the lost physical energies of our patient. For this purpose we must control judiciously, his whole course of conduct, and direct all his modes of life. If a manufacturer, an imprisoned appendage of the counting house, a “pale artizan,” invite him into the open field, let him hold the plough or handle the flail. Send forth the toil worn student and the idle sensualist, on distant voyages or long journeys, and let them travel on foot or on horseback. It is my conscientious belief that nothing less than this total change of all the habits of living, will be of any notable or permanent advantage to those afflicted with the very obstinate morbid condition of which we are speaking. I have known more than one patient kept on a low vegetable diet, and bled and purged again and again for days, nay, for months, and yet stand in the same apparent need of these remedies as at first. “How much blood think you,” said to me a gentleman under these circumstances, “how much blood is in this apple? I have eaten nothing but such food for some weeks, and still my physician tells me my pulse is as much excited, and I require the lancet as much as ever.”

You are familiar, doubtless, with the story of a sage dervise who cured a plethoric sultan in the East of a long list of diseases. A hollow globe was made to contain certain herbs of great reputed virtue, and a handle being affixed to it, the sultan

was ordered to use it as a hammer many times a day, so violently as to occasion profuse sweating. He complied with this direction, and in process of time was restored to perfect health, not, his physician told him, by any influence conveyed, as he expected, from the herbs to his body, but by the simple virtue of vigorous exercise. This is indeed the great, may I not say the only remedy; without steady and unremitting employment of which, your more formal prescriptions will produce no effect or worse than none.

This prophylactic treatment of the hemorrhagic patient, however, must be conducted with care and nicety, and will require much modification in the various instances which present themselves. Thus—though as I have above stated in strong terms, the great principle to be kept in view is the re-establishment of the proper tone of the system, by earnest and persevering exercise, yet you will meet with cases in which this chief remedy is altogether inadmissible, or must be resorted to with extreme delicacy. All motion, you are aware, acts as an excitant to the circulation, increasing its rapidity and force, and the immediate evil thus occasioned, is often so prominent as to prevent all the good effects which might have been anticipated for the future.

It was in the contemplation of such cases as these, in which all exercise must be forbidden, that Sydenham made the so often quoted declaration—"He who discovers a substitute for exercise on horseback, will find what is infinitely more valuable than the philosopher's stone;" and to such cases I would apply the remark of Cadogan, in recommending a milk diet to gouty patients, who would sometimes reply that their stomachs could not bear it—"the very instances in which the remedy cannot be borne, are those in which it is most needed."

As early, then, as your patient can endure to be removed without injury, let him be gently carried forth into the open air, if the temperature of the season admit. If not, place him in a rocking chair or in a chamber swing. Walking is a mode of muscular exertion, too exciting at first, but there are many modes of useful gestation, as in a carriage or boat; set him as soon as you can in the saddle, still protecting him from all dangerous atmospheric changes.

Those unfortunate subjects in whom the tendency to periodical hemorrhage has become a habit, require special attention. When the flow of blood is expected, keep the patient at rest, on low diet and in the utmost tranquillity, moral and physical. The lancet and the proper revulsives may be employed as circumstances indicate. A thorough change of condition in life should be recommended—a long journey, a sea voyage, another place of abode, a different occupation should be tried, while a strict and watchful avoidance of all occasional exciting causes is most impressively enjoined.

Some of the atonic hemorrhagies are evidently connected with, if they be not dependent upon, a deterioration of the blood—a change in the crasis of the vital fluid. I have met with this state of things in hematemesis not seldom; and in scurvy and in purpura—(if these be regarded as hemorrhagic affections in the proper sense, which I doubt,) such a pravity or morbid condition of the blood is always present. It is to this class of cases that astringents are peculiarly adapted, and such tonics and stimulants as are possessed of astringent properties. The salts of iron, lead and silver; alum and some of the mineral acids; kino, catechu, galls—these are the articles most in repute. It must not be forgotten that the most active hemorrhages are likely to degenerate and assume an atonic character, both by their own protraction and by the debilitating and depressing influences of the remedies which are employed in the first stages. There is then, in a very great number of cases, a sort of transitive condition, in which astringents are well adapted and of great value, independent of any tonic or other qualities which they may possess. I place most confidence, under these circumstances, in the acetate of lead; others rely principally upon alum. The nitrate of silver is exceedingly useful, where it can be applied to the surface affected. Indeed I know nothing whose *modus operandi* can be said to be in such direct opposition, such positive contrast to the hemorrhagic tendency in any part.

But the application of our remedial means is best discussed in detail, under the separate heads into which the particular hemorrhagies are divided; and to the consideration of these, in a brief way, I next proceed.

CHAPTER XV.

PARTICULAR HEMORRHAGES.

EPISTAXIS. Hemorrhage from the nostrils is a disease of very frequent occurrence, both in connection with other maladies and in an insulated way. It is little feared in general; nay, it has come to be regarded very often as salutary in a high degree. In many fevers, and in the headaches which attack the young and robust, the loss of a small quantity of blood from the nose is usually coincident with a subsidence of the violent cerebral suffering, and is supposed to be productive of great relief. Of all the hemorrhages, it has attained the highest confidence as of critical benefit in such cases. It is perhaps also the most frequent of them, as assuming a vicarious character—being often substituted for natural or habitual discharges when suppressed. There are no popular prejudices which have spread more widely than these, even among our profession, and none have taken deeper root. It would seem in vain to contend against them, but I will venture at least to express my dissent; and to state my own views of the subject. In regard to fevers, my own observation is that this, like all the other hemorrhagic discharges that belong to the history of fever, is not likely to occur in the early stages, when, if ever, they would be desirable and salutary, but come on after the violence of vascular excitement has in some measure subsided; they follow rather than precede, and therefore cannot logically be regarded as causing the diminution of pains in the internal parts—a remark which, if you attend to the subject carefully, you will find to be especially true as to headaches. If we notice the several stages of fever carefully, we shall meet with epistaxis at the end of an exacerbation; at the commencement of a remission. It depends upon, and does not give rise to favorable changes. It is not always even a token of favorable change; but as far as my own experience goes, as frequently precedes and betokens unfavorable change in the state of a patient. In ordinary headaches, it does not bring about the relief with which it is occasionally coincident; for it is the result of a

counter irritation—an altered determination of the fluids, not the cause of this irritation and determination. The pain in the head is owing to a centrifugal determination of the blood, by which the cerebral vessels are enlarged and distended. Epistaxis ensues when a centripetal determination is in any manner set up, and the vessels of the schneiderian membrane become the seat of engorgement and congestion. We do not know the nature of this change—we cannot imitate or effect it artificially. Cephalic snuffs have been invented, of very varied quality, intended to irritate the membrane and bring on bleeding from the nose; and stimulant odors and volatiles are perpetually resorted to with the same view—how ineffectually, let the sufferers from constitutional headaches be called upon to testify. When we bleed topically from the same surface, as by leeches, the failure of the effort to relieve the cerebral vessels is no less notable, and indeed is proved by the more general reliance placed on the abstraction of full quantities of blood from the arm, or the revulsive measures of cupping about the neck, shoulders and epigastrium, and bleeding in the foot.

There is, for the most part, no difficulty in restraining the accidental epistaxis of childhood or early youth. The application of cold to the head and face is usually sufficient. A variety of other modes of producing similar impression are resorted to; a large key is thrust down the back—the feet are put into cold water—the patient is directed to sit in a tub of cold water. The general cold bath is used either by affusion, the most efficient method, or by immersion. These transient remedies, however, do little more than procure a sort of truce with the disease; to prevent its recurrence, when a repetition after brief interval has shown the existence of such a tendency, we must endeavor to remove its causes, and do away the state of constitution on which it is engrafted.

Entonic epistaxis is accompanied or preceded by giddiness or pain in the head, flushing of the face, and other marks of undue cerebral determination, with a pulse somewhat full, tense and frequent. This state of things requires an immediate resort to active antiphlogistic measures. Blood should be taken from the arm, if the intensity of the symptoms demand it. In general, however, a saline cathartic will reduce sufficiently the excite-

ment present, and confinement, for a few days, to a vegetable diet, with rest and abstinence from mental and physical exertion, will establish a tranquil condition of the system. We should enquire into the habits, amusements and occupations of the patient. The games of childhood demand regulation. The heat of the sun must be avoided, and the ardor of too vehement exercise restrained; we must forbid the performance of dangerous feats of agility, as summersaults, etc., and the assumption of improper postures, those especially which keep the head hanging or the neck bent backwards.

In the more advanced periods of life, epistaxis becomes now and then a very serious and alarming affection. Immense quantities of blood are often lost in this way, and the greatest degree of debility thus induced. Indeed, the dense congeries of minute vessels spread out upon the lining membrane of the nasal cavities, become, from a repetition of these bleedings, so weak and relaxed in their structure, that they are ruptured or become patulous upon the slightest effort, such as sneezing, blowing the nose, coughing, and the like. In such cases, the hemorrhage commonly breaks forth suddenly and without any warning, unless when the attack is brought on by some special mode of excitement, as exposure to the heat of the sun, or a fit of anger or other passion. These determine a coincident pain in the head, flushing of the face, weight or tension across the forehead, flashing of light before the eyes, and other tokens of a tendency to apoplectic seizure.

These may or may not be relieved by the epistaxis, and it will, therefore, be unsafe to depend upon it; the patient should be treated as if it had not occurred, and with a view to obviate the danger of cerebral affection, to which he is so clearly exposed.

When epistaxis becomes atonic, it is exceedingly difficult to check or restrain it, and we must call in to our aid the mechanical resources of surgery. Astringent solutions should be injected up the nostrils, and powdered galls and alum blown into those cavities. A modern writer has recommended very highly the same use to be made of powdered gum acacia. The head should be thrown slightly back, the shoulders elevated. The old modes of applying pressure by the introduction of tents

simple and medicated with astringents, have been ridiculed by Abernethy, who declares, however, that he had always succeeded "by the introduction of a cylindrical plug of lint through the anterior nares, large enough to fill the tubular part of the nostril, wetted and wound round a probe, passed along the floor of the nose to the posterior aperture, but not into the throat. The probe to be withdrawn, and the lint left until the pressure and the formation of a coagulum had fully restrained the bleeding." In the meanwhile, the requisite measures of revulsion should be instituted, and a proper course of general management followed. A blister should be applied to the back of the neck; the bowels, if before constipated, gently moved by laxatives, and some astringent tonic, as the infusion of cinchona or the muriated tincture of iron, administered in the requisite doses.

HEMORRHAGE FROM THE MOUTH, THE GUMS, FAUCES AND TONGUE—very rarely occurs independently of some accident, or in the train of some constitutional disease. It is met with as a part of the history of scurvy and of purpura, but these, as I have already intimated, are something more than mere hemorrhagies, involving universal cachexy, a degenerate state of the blood and all the fluids derived from it, and a peculiar breaking down even of the solids of the body. In purpura hemorrhagica, we shall not succeed in the effort to restrain the oozing of blood from the various surfaces that allow its escape, until, by a judicious employment of alteratives and tonics, we shall have restored the powers of the stomach, and invigorated the nutritive and assimilative functions.

In scorbutic subjects, the same general treatment is required, with the addition of an absolute necessity, not well understood, for free indulgence in nourishing fresh meats, and vegetable acids, as vinegar and lime-juice.

Bleeding from the mouth, which, among other hemorrhages, shocks and annoys us so much in the latter stage of malignant fevers, is a very bad symptom, and is of very difficult management. The altered state of the fluids in these cases, is abundantly shown in the dark and attenuated quality of the blood thus discharged, and in the intolerably fœtid odor which it gives

out. Yet, it is not always either thin, dark, or disagreeable to the smell. I have seen it exhaling from the unbroken surface of the gums and tongue, of a bright red, of ordinary smell, and readily disposed to coagulate.

A very interesting case of bleeding from the gums, is related by Dr. B. Coates, in the July No. (1828) of the North American Medical and Surgical Journal. The subject was of a family noted for hereditary predisposition to dangerous and fatal bleeding from slight causes. A tooth had been extracted, from the socket of which a half-gallon of blood was lost in twenty-four hours. After many attempts, assiduously persevered in for five days, to check the flow of blood from the lacerated spot, the hemorrhagic tendency spread itself to all the vessels around. Dr. Coates says he distinctly saw the hemorrhage proceeding from "the surface of the uninjured gum." His patient recovered after bleeding for the space of nine days.

In several instances of a similar nature, that have come under my own notice, it has appeared to me, that the bleeding was kept up, increased and extended, by the use of washes and styptics, which acted as local stimulants, thus augmenting the determination to the vessels affected and those immediately adjoining.

It is evident, that the effect of such applications must be injurious at least in entonic or active hemorrhage; I cannot think them proper or innocent even in the contrasted forms of passive atonic character. It may be well to try, in the first instances, the milder astringents, holding ice and iced water in the mouth, washing with moderately strong solutions of acetate of lead, sulphate of zinc or of alum, infusions of bark, of kino, of catechu, of galls, or the rind of pomegranate. These failing, I resort, without delay, to the employment of the nitrate of silver, which seems endowed here with peculiarly happy powers. I know not what portion of its efficacy should be attributed to its chemical influence upon the animal fluids. It has, however, a prompt and obvious action upon them. It seems to coagulate directly the albumen which they contain. I have often seen the crimson surface of a tongue, lip, or gum, from which the blood was fast exuding, assume, under its repeated application as a lotion, a paler hue, and the bloody exhalation at once sus-

pended. You may aid its good effect by pressure, and, with this view, pledgets of lint soaked in its solution, made of the strength of 3 to 10 grains to the ounce of pure water, may be laid upon the bleeding gum or tongue, or the mouth partly filled with them. I have seen this plan effectual in checking a hemorrhage which nothing else could restrain, and which having debilitated the patient to the last degree, threatened quickly fatal results.

While making use of these local remedies, we must not neglect the due attention to the state of the general system. If the case be of the active or entonic form, we may diminish the vascular action, and derive from the affected part, by the exhibition of a purgative, giving preference to the saline cathartics. A blister may, with advantage, be laid upon the back of the neck or between the shoulders, and the head subjected to the impression of cold, by pouring iced water, in a full stream, from some height, upon the occiput.

If, on the other hand, the patient be in an enfeebled atonic condition, he should be treated with tonics and stimulants, and induced to partake, notwithstanding the inconvenience offered by the hemorrhagic affection of his mouth, of nutritive fluids in such amount as may be required to sustain and invigorate his system.

HEMOPTYSIS. Under this appellation, which literally signifies spitting of blood, I propose to treat briefly of all hemorrhages from the organs of respiration—the larynx, trachea, bronchi and lungs. It is one of the symptoms or attendant circumstances of phthisis pulmonalis, and occurs not very often as an original affection. Andral remarks, that not more than one-fifth of his cases of hemoptysis were free from tubercular disease. According to Morton, the sources of hemoptysis are four. 1. The Bronchial Mucous Membrane. 2. The Pulmonary Tissue. 3. The Rupture of a Vessel. 4. The Parietes of Abscesses.

The conditions under which it may occur are not less various. 1. It may attend upon active congestion suddenly developed in the lung. 2. It may be the result of a passive congestion. 3. It may arise from violent action in the organs of respiration, or

4. From violent general muscular exertion. 5. It may be the result of disorganization from disease.

Cullen has distinguished five species of hemoptysis. 1. Hemoptysis plethorica; which will include Laennec's pulmonary apoplexy as well as the other forms connected with inflammation and congestion. 2. Hemoptysis violenta; from external violence, as blows and accident of any kind. 3. Hemoptysis vicaria;—from the suppression of some accustomed evacuation. 4. Hemoptysis phthisica; as connected with the various disorganizations of consumption; and 5. Hemoptysis calculosa; supposed to arise from concretions within the lungs.

I have never met with any embarrassment in distinguishing hemoptysis, though the books speak of cases in which the diagnosis is difficult. When blood is thrown out from the mouth frothy, and of bright arterial red, with coughing or deep hawking, it is evidently from the respiratory apparatus; and this is usually the description of a sudden attack unpreceded by pulmonary disease. In some instances of phthisis, it is true—and such a case is at this time under my care—the blood expectorated is dark, grumous, and offensive, but this change in its qualities by which it has come to resemble the blood thrown up in hematemesis and similarly altered in the stomach, is plainly ascribable to the condition of the patient. For the most part too, hemoptysis is preceded by certain oppressive and painful sensations in the thorax—tension, or weight, or a pungent pang, or a feeling of stricture across the chest.

By a proper consideration of these antecedent symptoms, we shall often be able to ascertain the source from which the blood is derived. We distinguish bronchial, tracheal and laryngeal hemorrhage, by the fact that it is unaccompanied usually by any of those tokens of respiratory distress above described, which attend upon or precede pulmonary bleeding. It usually comes on after a vehement fit of coughing, produced by a titillation in the air-passages. 2. Hemoptysis from the pulmonary tissue, the pneumorrhagia of some modern writers, is the effect of a congestion of the vessels of that tissue, betokened by a train of constitutional symptoms which are rarely wanting. Laennec speaks of it, as brought on by such circumstances as give rise at the same time to “an increase of the circulatory and a diminu-

tion of the respiratory function." There is a sense of heat and weight in the chest—dyspnœa—cough, and frequent pulse. The temperature of the surface is variable. The blood is of bright color and frothy. 3. Hemoptysis from a ruptured vessel, is an accident of very unfrequent occurrence, though cases are recorded by both Bayle and Andral, and are occasionally met with in practice. It is affirmed by pathological anatomists, that "in proportion as blood vessels are denuded by ulceration, their parietes become thickened at the expense of their calibre, and their function ceases." Hence, we have so few hemorrhages of large amount in the latter stages of phthisis, and so few terminations of that disease in this way. It does happen now and then, that persons in ordinary health rupture a pulmonary vessel of some size by violent muscular action, loud crying or singing, and the like. 4. Hemoptysis from the parietes of an abscess, I am inclined to regard as much more commonly to be noticed among consumptives, than writers have mentioned. The blood, in such cases, is apt to assume a dull, dark tint—the flow returns at short intervals—gives out an offensive odor—does not depress the strength or spirits of the patient, who soon becomes familiarized to the appearance.

Hemoptysis generally occurs between the age of puberty and the attainment of the full maturity of body—from the fifteenth to the thirty-fifth year. It is readily engrafted upon the plethoric or hemorrhagic tendency as generally developed, especially if there be any original malformation of the thorax, whether hereditary or otherwise. Thus, those who in early youth have been subject to epistaxis, are liable to it, and particularly if of slender make, with flat, narrow, or otherwise misshapen chest.

The causes of hemoptysis have been already enumerated as those of hemorrhagy in general, and while speaking of the conditions of the system with which it may be connected. We may again allude to them under the several modes of local or diffused excitement of the vascular actions by violent muscular exertion, as in playing upon wind instruments; the use of the blowpipe in the arts; loud speaking, singing and reading; running, leaping, etc., all which call for intense respiratory efforts, and thus produce pulmonary congestion.

The Prognosis in hemoptysis will depend upon a due consid-

eration of the circumstances already discussed. If a large vessel be ruptured, the danger must, from the structure of the parts and the importance of the organs concerned, be necessarily very great. In the far more common case of hemorrhage from congestion, that state of the lungs which McIntosh and others, after Laennec, have been fond of calling a pulmonary apoplexy—the pneumo-hemorrhagic of Andral, the danger may also be imminent from the quantity of blood, which, escaping from the vessels of the mucous tissue lining the tubes, fills the cells, prohibiting the entrance of air and threatening suffocation. This will rarely happen, however, if the patient be of ordinary vigor. I have seen many very terrible and menacing hemorrhages of this nature, but none immediately fatal.

Hemoptysis occurs in so large a proportion of patients who die of consumption—Andral says “five-sixths”—that we should always be suspicious of the condition of the lung in the subject of it. The illustrious Frenchman just quoted, tells us, he “once only (*une fois seulement*) saw a death from bronchial hemoptysis—broncho-hemorrhagic,” in which the pulmonary parenchyma was perfectly sound. In all others, he found tubercles in different stages of development. This almost uniform coincidence has led some writers to the opinion, that hemoptysis may be a cause of the formation of tubercles, especially as it is, in some instances, the very first symptom presented of pulmonary disease. I am, however, rather disposed, on the other hand, to regard the presence of the tubercle as predisposing to hemorrhage by the mechanical disturbance it occasions in the circulation near it. At any rate, if a mere coincident, and neither cause nor effect of the hemoptysis, it would show such a morbid state of vascular and nutritive action in the lung as may readily admit of hemorrhage on the application of any mode of excitement.

There are two classes of cases in which hemorrhage, to a large amount, may take place from the lung, without being followed by any serious consequences. The first which I shall mention, is that hemoptysis which is vicarious of, or substituted for, some accustomed evacuation, natural or morbid. For example—I have had under my care a young lady, who, for many years, while laboring under amenorrhœa and dysmenorrhœa, coughed up almost incredible quantities of blood. I have seen

her, while engaged in conversation, repeatedly eject, in this way, from six to eight ounces at once, with very little apparent inconvenience—nay, with scarcely an interruption to her voluminous discourse. She was short and corpulent, though in ill-health.

The second set of instances to which I allude, may be met with in persons of athletic and robust constitution, and of sanguine temperament. Andral gives, in his XV. observation, (Vol. IV., p. 171,) a remarkable case of this nature, and I have known of some few, scarcely less singular. They seem to suffer nothing whatever from the attack, either directly or indirectly.

In bodies dead of hemorrhage from the lungs, the appearances vary, of course, with the coincident conditions. I have said, that bronchial hemorrhage is almost universally concurrent with tubercular disorganization; but the membrane from which the blood has issued, is not changed in structure, its integrity being as little affected as in simple bronchitis. Nay, the surface is not always even reddened, but sometimes offers quite a natural aspect. In pulmonary apoplexy—pneumo-hemorrhagic, there is infiltration of blood throughout the smaller air cells and tubes; the very tissue or parenchyma, indeed, seems sometimes broken down, and scarcely distinguishable from the clots or coagulated masses. This is a condition which I have never seen, but both Laennec and Andral speak of it as not very infrequent. The latter writer tells us, also, that he has found the cavities of abscesses, when they existed in the lung, filled with coagula.

The treatment of hemoptysis must be regulated very much by the condition of the patient, as well as by the circumstances of the attack. If the pulse be full and strong, and the subject robust, or at any rate of tolerably firm constitution, it may be well to resort at once to the lancet. The quantity of blood to be taken, must be determined, in great measure, by the tolerance of this mode of depletion. In pneumo-hemorrhagic, very full venæsection is required and generally borne exceedingly well. McIntosh, and some other practitioners, both in Europe and this country, seem to me to have pressed the remedy to an extreme. I would advise some caution in the matter. This is, perhaps, as often entonic in its commencement as any of the hemorrhages, but in subjects previously invalids, or in any manner

debilitated, it will not be difficult to convert the case into a passive or atonic one, by ultra-depletion, when our embarrassment in the conduct of it, will of course be grievously augmented. Pains must be taken to determine from the thorax, and equalize the force of the circulation. Warmth should be applied to the extremities, and irritants, in various forms, to the surface of the limbs and trunk.

One of the most efficacious remedies for hemoptysis, and at the same time always convenient—always at hand, is the chloride of sodium—common table salt. It may be eaten by the teaspoonful or drunk in strong solution; and there is no reason to dread an overdose, for if the quantity taken should offend the stomach and occasion vomiting, this will be of no injury to your patient. It is a doubtful question, how this article acts in restraining the flow of blood. The precise mode may, perhaps, be difficult to point out; but I am inclined to regard it as a revulsive, irritating promptly the whole mucous surface of the esophagus, and thus deriving from the pulmonary surface. I am not aware that it possesses any direct styptic or astringent quality.

Emetics and nauseants are highly recommended by numerous authorities. The influence of the former may be occasionally injurious, however, from the muscular exertion and straining to which they give rise. Cullen mentions an instance in which the hemorrhage, for which he had administered an emetic, had been alarmingly increased by it. I do not hesitate to say, notwithstanding, that my own experience has been rather favorable to the use of emetics; the nauseants which I frequently prescribe, have repeatedly produced vomiting with no disadvantage; nay, on several occasions, with apparent benefit. Yet, perhaps, it will be the safer practice to abstain from full or vehement emesis. For the production of nausea, you will find ipecacuanha in small doses, half a grain, every ten or fifteen minutes, the most manageable article in the *Materia Medica*. Squill and digitalis are also employed in a similar way.

In the future management of the cases, several of the neutral salts are made use of in combination with our nauseants, as sedative and refrigerant. The nitrat: potassæ is perhaps the best of these. To obtain its full effect, it must be prescribed in large

and free doses. To the effects mentioned above, the sulph: magnes: the epsom salt adds a purgative operation, and deserves therefore a preference in many instances. It is prompt in its action on the bowels, deriving usefully from the oppressed organs, and with a very obvious power of reducing vascular excitement, both directly and indirectly, seems to me to combine something of the peculiar adaptation to the circumstances, universally ascribed to the common table salt.

As in epistaxis, cold is applied by some physicians to the various sensitive parts of the body; nay, some have talked of "piling ice on the chest." I do not see any objection to the application of cold to the genitals, which is affirmed to have checked some large hemorrhagies from the lungs; but I confess I have no experience with it, having considered it doubtful whether it were proper to resort to any means likely to cause a constriction of the vessels of the general surface, and thus run the risk of determining a large proportion of blood to the intestinal organs.

Entonic hemoptysis is usually controlled by the measures above indicated—if promptly instituted and energetically carried into effect—as, depletion by the lancet and cathartics, reduction of vascular excitement by nauseants, refrigerants and sedatives, and the use of common salt. A sort of secondary condition of the system, intermediate between its entonic and atonic states, is now presented, and the hemorrhage, if not checked, assumes a corresponding character, transitive from the active to the passive form, which demands certain modifications of our treatment.

It is at this stage that we shall derive the fullest advantage from the acet: plumbi; which, whether as a mere astringent, or by some more obscure and specific efficacy, often exerts a highly beneficial influence. Great caution has been thought necessary in its administration, but I have not seen any injury from it. In threatening cases, two, three or four grains may be given every hour. It is most useful I think when combined with ipecac: and opium. This latter medicine is especially called for, and indeed indispensable, when there is present any degree of continued irritation in the air passages exciting cough, and its exhibition should be carried to the full extent required for subduing this irritation.

The revulsive influence of epispastics, is to be resorted to

under these contingencies. They should be laid in succession upon the thorax, the arms, the back of the neck and the lower extremities. They are particularly demanded when any tension, oppression or pain in the chest remains after V. S. has been carried to the proper extent; these symptoms they often remove at once.

I have not mentioned as yet the antimonials, which, however, constitute the principal reliance of many practitioners in entonic hemoptysis. I will not deny their efficiency, yet I regard them as adapted rather to such hemorrhages as are connected with and dependent upon pulmonary inflammations than to hemoptoe proper; and I would farther advise them to be watched with great care, as their continued exhibition tends strongly to depress the tone of the constitution, and to convert active into passive hemorrhagy. The tartarized antimony is the most certain and perhaps most manageable. It may be prescribed alone in solution, or to establish a tolerance of it, with tinct: opii: or combined with the nitrat: potassæ in such doses as the stomach will bear. James' powder, or the pulv: antimon: of the shops may be serviceably administered with pulv: digital: to which the sulph: potass: or nitrat: potass: may be added,—by the one determining moderately to the bowels, by the other to the kidneys. If from these formula, occasional nausea or even moderate vomiting should occur, this will probably do no harm to a subject of ordinary vigor, though it might injure a very weak patient.

Atonic hemoptysis will require from you a very different course of treatment for its relief. Your patient will be languid; his pulse frequent and feeble; his skin cold; and his breathing rendered difficult, not only by the effusion within the air passages, but by actual want of muscular power to sustain the fatiguing efforts in respiration. Let him recline well supported, with his shoulders somewhat elevated. Table salt should be given him quickly by the teaspoonful, and his chest and extremities subjected to the revulsive effects of heat and irritants—mustard poultices and the like. You must not shrink, if his condition demands it, from a prompt resort to the class of diffusible stimulants, of which camphor and ammonia are to be preferred. Such pulmonary irritation as may be present, must be

allayed by the exhibition of opium, to which the acet: plumbi in large amount should be added as a safe and efficient astringent. Alum may be employed for the same purpose in full doses. Vesicatories should be applied early and repeatedly.

If the case protract itself, the more permanent tonics must be had recourse to. Bark and iron—the strong infusion and the muriated tincture must be administered alternately. Wine, ale, or porter should be ordered, and a nutritious and even stimulating diet allowed.

Convalescents from hemoptysis must be laid under strict restraint—enjoined for a sufficient length of time to give opportunity for a restoration of the healthy condition and function of the lungs—as to the employment of the voice. In severe cases, especially of the atonic form, they should be absolutely prohibited from speaking, even in a whisper. Great care should be taken to protect them from the impression of any of the exciting causes of hemorrhage.

When we judge it prudent that they should be permitted to take exercise, we must graduate cautiously the degree of exertion and exposure. Swinging, sailing in moderate weather, riding at first in an easy carriage, and afterwards on horseback, should be in succession resorted to; and such habits of conduct and course of life begun and fixed as are best adapted to give tone and vigor to the debilitated constitution.

HÆMATEMESIS—Vomiting of Blood. Blood thrown up from the stomach, is usually grumous, imperfectly coagulated, dark colored, and mingled with mucus and other contents of the affected viscus. The act of vomiting is preceded by oppression at the scrobiculus cordis, a feeling of faintness, and sometimes a pungent pricking pain in the stomach.

The absence of cough and other irritation of the respiratory apparatus, the color and appearance of the blood discharged, and the attendant nausea, faint sickness, and gastric effort, will in almost every imaginable case, prevent the possibility of confounding hematemesis with hemoptysis.

The causes of this hemorrhage are often obscure, and it occasionally comes on quite unexpectedly and without any warning.

It is most apt to be met with in subjects broken down by habits of intemperance and debauchery. It may be brought on by blows on the pit of the stomach ; perhaps by violent straining to vomit ; by obstructions to the regular and normal course of the abdominal circulation, as by tumors within that cavity, and by pregnancy ; and by the suppression of some accustomed sanguineous evacuation, as the catamenia in women, and hemorrhoids in men.

In general it is not a disease of very great danger, though in some instances the discharge of blood is large and rapid, and there is more immediate and greater prostration of strength and apparent exhaustion on the part of the patient, than is observed in other hemorrhages proportionally. The circulatory system seems to succumb more promptly under the effusion of blood within the stomach, and from the vessels of the gastric surface, than elsewhere ; the pulse becomes weak, and the subject of the attack sinks almost at once into an atonic condition.

The treatment of hæmatemesis is not well settled. If the pulse be hard, or even of moderate firmness, and the general strength not decidedly impaired ; and more especially if any symptoms of local or diffused excitement present themselves, such as heat of skin, pain and throbbing at the pit of the stomach, it may be proper to have recourse to venæsection, though even now the use of the lancet will require some caution. Under the same circumstances, laxatives—preferring the neutral salts—may also be advised. Ice swallowed in pellets, or frequent small draughts of iced water, are likely to be useful here also. In the meanwhile, counter-irritation must not be neglected, and the skin over the stomach and of the abdomen widely, should be reddened with mustard.

In the great majority of instances, however, you will perceive no necessity for depletion, in any form. All evacuants are undapted and inadmissible, and the immediate exhibition of astringents is imperatively called for. These produce so much the more certainly and quickly a good effect, as they are applied directly to the bleeding surface. The acet: plumbi is the most valuable article of the class, and may be administered either alone or in union with opium, which has a happy influence in

subduing the irritability of the disturbed stomach. Two to four grains of the salt of lead may be prescribed with one fourth of a grain to a grain of opium, to be repeated *pro re nata*.

The muriated tincture of iron has a high reputation as a styp-tic here, given in doses of twenty to thirty drops in cold water, every half hour or hour. All the vegetable and mineral astringents have been duly experimented with. Alum is preferred by many. The nitrate of silver is loudly extolled, and in protracted cases will be found very serviceable. Others select the vegetable articles, kino, catechu, the infusions of bark, nutgalls and the rind of the pomegranate. Turpentine is strongly recommended, and I have seen it useful. From analogy, it is sometimes employed in the hemorrhagic state of our fevers, and for the purpose of checking the black vomit. Where stimulants are necessary, brandy with iced water, will be found both efficacious and convenient.

In the meanwhile, the abdomen should be extensively irritated with mustard and vesicatories, and the extremities kept carefully warm and similarly excited.

The bowels may be moved by enemata, or if necessary, by a mercurial cathartic, or with spirits terebinth. Constipation must be carefully avoided, as a condition very evidently opposed to a complete recovery. In the vicarious hæmatemesis of women, Dr. Hamilton affirms, and he is sustained by numerous and respectable authorities, that the exhibition of purgatives continued in his characteristically slow and prudent manner, will be found more effectual in restoring health than any other plan of management.

The convalescent should keep the trunk of the body well enveloped in flannel. His diet should be generous and nourishing but light; and care should be taken to avoid oppressing the digestive organs by undue quantities of food. The impaired tone of the stomach may be improved by the use of an infusion of bark with some alkali. Port wine diluted is often a serviceable beverage, though stimulants must be used moderately. Some have advised the mineral acids. I prefer to depend upon iron, when it is required to persevere in any medicinal formula; and the two may be combined, as in the muriated tincture.

INTESTINAL HEMORRHAGE.—HEMORRHAGIA PROCTICA.—MELCENA.—Like the mucous membrane of the stomach, that of the intestinal tube, from the pylorus to the rectum, is subject to the hemorrhagic condition, which may supervene either independently or in combination with other elements of disease, as in dysentery and hemorrhoids. Blood discharged by the anus, is apt to be grumous and black, probably because acted on by some of the gases always present in the alimentary canal, and exhibiting their influence even on that which is vomited, though in less striking degree.

When it assumes the contrasted hue, and is florid and of natural appearance, we infer at once that it proceeds from some vessel or portion of the surface near the extremity of the rectum, or that its source is abundant, as when some large vessel, especially an artery, has been ruptured or eroded. Hemorrhage takes place from the upper portion of the bowels, probably on account of some impediment to the normal circulation in the abdominal viscera, as from chronic hepatitis, splenitis, and other tumors. The only case of well marked melœna that I have ever had under my care, is obviously connected with hepatic derangement of long standing.

I have seen two instances of promptly fatal hemorrhage from the bowels. One of them, formerly mentioned to you, was a convalescent from remittent fever, in whom was discovered on examination post mortem, an ulcer that had eroded the coats of a large vein. The other happened during seeming recovery from cholera asiatica, in a black, who was buried without affording the opportunity of inspecting the parts.

The effect of these hemorrhages upon the system differs much in relation to its source and attendant circumstances. I have seen very large discharges of blood occur both in fever and in dysentery, without sinking or exhaustion of the patient, although reduced by previous disease. A surface in a state of inflammatory congestion contains a great quantity of blood, already virtually subtracted from the circulating current, which may exude from it, unloading its minute vessels, without injury to the subject: whereas if the same amount were drained off abruptly from a vein or artery of notable size, the result would be syncope, prostration, and perhaps death.

I have notes of four cases of spontaneous flow of blood from the anus, independent of the existence of hemorrhoids, or of the presence of any other intestinal or abdominal disorder. In each of these the discharge trickled away from the rectum, either before or after an alvine evacuation, or without any effort at stool, in various quantity and at different intervals. They were all easily relieved. Rest was enjoined in a recumbent posture, for a short time, during which they were kept upon a low fluid diet. Mild laxatives were given, for in all, constipation was present, and clysters of cold water were thrown up several times a day. After the disease seemed to be thus subdued, it was thought proper to advise the occasional employment of enemata, containing some of the mild vegetable astringents.

HÆMATURIA—Hemorrhage from the Urinary Organs. This discharge generally occurs after some accidental violence has been applied to the perineum, and probably arises from laceration of the urethral membrane, tearing open some of its vessels. It occasionally follows upon unduly vehement muscular exertion, as in lifting weights, leaping, riding on horseback. Contrary to the observations of Good, and others, the majority of the cases that I have met with, presented a flow of pure blood, generally unmixed with urine. One of these was singular in its history. The hemorrhage came on only after coition, and was almost uniformly attendant upon that indulgence. It was exceedingly difficult to restrain or control, and reduced the strength of the patient so much that he sunk gradually, and died of dropsy.

Hæmaturia rarely shows itself unconnected with disease of the kidneys or bladder; yet I had long under my care, a stout and otherwise healthy young man, frequently attacked by this hemorrhage, in whom I could not trace it to any of the sources above mentioned; either accident, violent muscular exercise, or previous or coincident disease of any character. Willis mentions that "a kind of endemic hæmaturia prevails in the Isle of France, without appearing to prejudice the health of the children, among whom chiefly it occurs."

This hemorrhage is generally met with among the young and

robust, assuming a marked entonic character. It is for the most part, relieved without much difficulty by absolute rest in a recumbent posture, low diet, venæsection perhaps, or topical blood-letting by cups to the loins, cold applications to the genitals and lower part of the back, as by sitting in cold water and by affusion, and the exhibition of some mild but efficient cathartic. Objections have been made to the saline purgatives, but I use the sal: epsom without any obvious inconvenience. If it appear tenacious, the acet: plumbi will be found useful; and not less so in accidental than in spontaneous hæmaturia. I succeeded in checking with it, administered in free doses, a hæmorrhage from the urethra, arising from a severe blow with a stick in the perineum, which had bid defiance to the application of all the other remedial means commonly employed in such cases. Next to the acet: plumbi, among our astringents, I have seen most benefit from the muriated tincture of iron.

To prevent the recurrence of the discharge when it has been checked, the patient must be enjoined to remain for some time quietly at home; and when allowed to resume his usual avocations, he should move about gently and with caution, avoiding all rapid action, and every violent muscular effort.

CHAPTER XVI.

HYDROPS—GENERAL DROPSY.

THE difficulty of defining what is not exactly understood, can never be felt more burdensome than in the discussion of the subject before us. We may describe the disease Dropsy by reference to a single characteristic symptom—as “a preternatural collection of serous fluid in one or more of the cavities of the body, or in the cellular tissue;”—but it is easy to show the error, pathologically considered, of thus confounding all serous collections; and hence, we may infer, how untenable those more

labored pathological definitions offered by authors, and so constructed as to imply the truth of their exclusive opinions as to its nature, history and cause.

Dropsies are variously divided and sub-divided. They may be local and general. Local collections of serous fluid may not necessarily depend upon, or even suggest, any impairment of the constitution, and hence may be very incorrectly classed with dropsies, properly so called, which, even when local in their origin, soon connect themselves with a most obviously cachectic condition of the general system. Hydrocele is the most exclusively local of all serous collections; for not only is it met with in persons otherwise in the most perfect and robust health, but it has not occurred to me in the most pervading instances of general dropsy, to find, at any stage, this distention of the tunica vaginalis testis, though the scrotum may be filled to bursting. Similar observations may be made also, of what is called ovarian dropsy, the nature of which affection is doubtful and obscure. Hydrocephalus is, for the most part, insulated in this way, only showing its connection with the more familiar hydropic collections, by the fact of occasional metastases taking place—the head becoming diseased on the subsidence of anasarca, hydrothorax, and ascites. These last are never, or, if ever, very rarely presented to us independent of each other, as will be shown with certainty if their duration be prolonged or their progress unchecked. This almost uniform coincidence seems to prove their concurrent association with some predisponent or constituent condition of the general system, and of the truth of this view, there cannot, I think, remain a reasonable doubt. Such state of the constitution is known as the dropsical diathesis, and will be often referred to in our disquisitions, as an essential portion of the pathological history of the disease under consideration. It is true that each of the above named forms of dropsy may, in their invasion and during a brief course, exist in an insulated way. The least likely to present itself thus alone, is ascites, and yet it is known, both from observation and experiment, to have been the result of causes purely local, nay, even merely mechanical, which have acted upon some of the contents of the abdomen. Hydrothorax may occur, as you will hereafter learn, from mere inflammation of the pleura, though

this is rare. Anasarca may be in a double sense local; as first, where it is partial, the cellular substance of a single limb being thus distended, as is seen in sprains and other injuries; an instance of which is mentioned by Monro, where this symptom after a fortnight's duration, was followed by the universal spread of the swelling; and also in the œdematous effusions in dependent parts, so often seen in the latter stages of protracted and debilitating maladies. Secondly, there are certain cases of anasarca where the cutaneous intumescence is extensively diffused, which I am disposed, nevertheless, to look upon as local because unconnected, at least, in the first instance, with any degree of hydropic diathesis. We meet with these as consequences of the exanthemata pretty frequently, and of erysipelas; and I shall by and bye speak of a form of anasarca not uncommon among our black population, which I regard as of a similar nature.

Another division of dropsies readily grew out of the locality each collection of fluid was found to occupy, and significant names are applied to these to denote the situation of the accumulation. Hydrothorax, Hydrocephalus, are terms which explain themselves. Anasarca is a conventional word to denote effusion which occupies the cellular tissue, and Ascites is the title of abdominal dropsy.

Again, dropsies are known as symptomatic and idiopathic; the first of which are pointed out as consecutive upon some previous disease, and effects of some organic lesions of particular viscera; and the second, as unconnected with obvious precedent disease, and more obscurely and vaguely attributable to the general deterioration of the system—a form of cachexy spoken of as the hydropic diathesis. The existence of the latter condition has been denied, except as associated with some organic affection; but this cannot be always shown; its essential presence, therefore, must not be taken for granted. Farther, as dropsies present themselves in very opposite states of the body, in regard to strength and weakness, they are said to assume an entonic or atonic character, and in relation to the rapidity or slowness with which they supervene, and their connection with contrasted states of excitement and debility, have been termed acute and chronic.

A majority of the authors who have written of dropsy, have maintained the proximate cause of all its various forms to consist in the effusion of serous fluid, its most obvious and characteristic symptom; while a few, with a more liberal spirit of reasoning, have preferred to consider this effusion as one only of the train of effects attributable to a state of vascular action, more general and widely extended. There is no more difficulty in this doctrine, than in the belief of the gouty diathesis as precedent and necessary in the production of every separate arthritic paroxysm; or of occult scrofula, the strumous diathesis, as the basis of tubercular and other lesions of parts.

The effusion and collection of serous fluid in some cavity or tissue, must be allowed to rank as an essential point—a *sine qua non*, in the description of dropsy; for it is the definite result, and the only cognizable token of that obscure condition of morbid action in the vascular system, which we allude to as the hydropic diathesis. If the occurrence of some such effusion be not admitted as an essential part of the history of dropsy, we must go with some writers so far as to include under this head various cachexies, besides land scurvy and diabetes—an absurdity little less than the doctrine of the entire unity of disease. Yet on the other hand, if we make dropsy consist simply and directly in mere serous effusion, we render ourselves liable to numerous difficulties and grave errors. We shall thus lose sight of the obvious and important distinctions between collections of serum purely local, as in hydrocele and ovarian tumors, on the one hand, and those of general dropsies on the other; between œdematous affections arising from mere circulatory debility or mechanical injury, and the idiopathic effusions—between the results of local inflammation of certain tissues, and the true cachectic impairment of the functions of the exhalent and absorbent vessels. It should be remembered, too, that dropsy is not always cured when we have removed the whole collection of fluid, whether by paracentesis or by the efficient employment of hydragogue cathartics and diuretics. Nay, it is not unfrequent to notice in deaths from dropsy, a remarkable and sometimes a total subsidence previously, of the hydropic swelling.

All that is known of the minute pathology of dropsy, as stated by writers of the highest authority, seems to be comprised

in the assumption, that there is no longer the due correspondence of action which belongs to the normal and healthy state of the functions, between the exhalent vessels and the absorbents which open upon the several cavities. It is taken for granted, that in all these cavities a serous fluid is poured out for the purpose, as it is expressed, of lubricating the surfaces, and that this purpose being answered, it is duly taken up and carried away again into the circulation. Some authors would ascribe dropsies to an excitement, others to a laxity of the exhalents; others still, to debility or loss of power in the absorbents; the ultimate result in each being a morbid deposition or a failure to remove the fluid effused.

But these views are not free from difficulty. It is not proved that the occurrence of serous effusion into the several cavities of the body, is a natural phenomenon. J. Hunter affirms that "the juices which lubricate surfaces of living animals are in a volatile state." Others say that they have found no fluid at all in these cavities. It is noticeable more frequently perhaps, in the ventricles of the brain than elsewhere, and there is no other cavity in the body less liable to dropsical accumulation. It should be remarked, too, that the cells of the cellular tissue constitute the most common seat of hydropic collections; yet no one, so far as I know, has maintained that these cells are, in health, filled with a serous lubricating fluid, removed as fast as it is deposited. If any surface be lubricated naturally, it must be that of the tunica vaginalis testis; yet this cavity never fills in general dropsy. We cannot imagine it to be so insulated as not to partake in the morbid changes of other secretory surfaces. Therefore, dropsy does not consist in mere loss of proportion, between exhalation and absorption.

The dropsical fluid closely resembles, in chemical constitution, the serum of the blood, differing from it, according to Dr. Marcet, in presenting a somewhat diminished specific gravity and containing somewhat less animal and saline matter. But it exhibits an infinite variety of physical appearances and character. It is found limpid and inodorous, black and fœtid, bloody, sanious, milky, green, oily, acrid, so urinous or ammoniacal as to turn syrup of red poppies green, gelatinous and puriform: it has sometimes contained so much soda as to produce Glauber's

salt on the addition of sulphuric acid. Hewson is the authority who most positively declares the presence of a lubricating fluid in the cavities of healthy bodies recently killed. He tells us that "it resembles in every respect the fluid found in the lymphatics, and approaches the nature of coagulable lymph." "When suffered to rest," he says, "exposed to the air, it jellies, or coagulates spontaneously in half an hour." Now this spontaneous coagulation very rarely happens in dropsical fluids. Baillie mentions it in one instance. I saw it occur after paracentesis thoracis in another.

Such statements show that a mere increase of exhalation or a diminished absorption from these surfaces would be by no means sufficient to account for the appearances in dropsy, and we are driven to the conclusion of the absolute necessity of some specific morbid action in the vessels concerned in pouring out the accumulated fluids. We shall find too as we proceed, unless I greatly mistake, that while there can be no doubt of the great increase of exhalation, if that be the correct phrase—of vastly augmented effusion, it will be very difficult to prove, in any case, the fact of an obvious diminution of the power or action of the absorbents. Nay, we shall have repeated occasion to remark that both these functions go on coincidentally, with a rapidity and result far beyond what is natural.

There are few diseases the nature and history of which are so much influenced by the causes which have produced them as dropsy—and these remote causes are exceedingly numerous and diversified. Predisposition to it is said to be often hereditary, and dropsy may be regarded therefore as hereditary in this general sense. Van Swieten states, in his Commentaries, on the authority of Plutarch, "that amongst the ancients, the children of those who died dropsical (or consumptive) sat with their feet immersed in water while the dead bodies were burnt, that the disease might not pass to them;" and from Van Helmont, "that in Antwerp, the vulgar thought the dropsy would descend to the next heir unless all the water was drawn off from the dead body.

This predisposition, however, does not necessarily consist, as maintained by Blackall, in feebleness or inactivity of the constitution. Dropsy, indeed, connects itself with the most opposite

constitutional conditions—and some of its forms are much more frequently associated with hyperexcitement than with vascular debility.

A tendency to hydropic* affections, often arises from the influence of climate—and this influence may be exerted both directly and indirectly. Countries subject to cold and moisture, exhibit the first of these modes of predisposition. Hot and moist regions, on the other hand, give origin to malaria, which is not only a cause of dropsy, but produces many forms of disease of which it is a consequence.

Authors enumerate, among the causes of dropsy, general plethora, on the one hand, and on the other, general debility, however induced, as by bad air, innutritious diet, great losses of blood, other inordinate evacuations. Cullen speaks of the preternatural abundance or undue proportion of watery fluid in the blood vessels, as occasioned by drinking excessive quantities of water, particularly when cold, the cutaneous absorption of water from the atmosphere, and the interruption of the ordinary watery excretions, the sweat, urine, etc. The same author says it has followed a rupture of one of the lymphatics of the thoracic duct, of the lacteals—and erosion or rupture of the ureter, kidney and urinary bladder.

It seems to be the direct effect of many diseases—scarlatina most of all, gout and influenza; it succeeds many others, whether directly or indirectly, being occasionally associated with every variety of local organic lesion. This is true remarkably of derangements of the abdominal viscera, the liver and spleen. Dr. Bright has drawn the attention of the profession to the frequent connection of dropsies with nephritic affections; having detected a very great variety of disorders of the kidney, which show a tendency to produce these accumulations of fluid. Abortions give rise to dropsy; and so do the irritations of pregnancy and of dentition. The abuse of many medicines is followed by the same consequences, whether immediately, or by their impressing certain local organic derangements; drastic cathartics, mercury, bark, iron, the vegetable acids, are all accused of this evil tendency. Intemperance in the use of ardent spirits, is one of the most prolific sources of dropsy in its worst forms. Whether this fatal habit be carried to the extreme of sottish debauchery

and drunkenness, or limited to such indulgences as may be allowed, without actual exposure and ruin to the reputation, the effect is ultimately the same; the vitality of the system is exhausted by the incessant application of inordinate stimuli; the powers of the stomach are worn out by the repetition of excesses, each more debilitating than the former, or its tissues thickened and inflamed by being so constantly bathed in a heating and almost caustic fluid; the chylopoietic viscera become universally obstructed and indurated, and disease and death must at length ensue.

Autopsy. The morbid anatomy of dropsy is more interesting than instructive. Dissections of the dead can assist us very little in our investigations into the nature and pathology of functional diseases. In idiopathic general dropsy, the cavities of the body contain a thin, serous fluid, which is extensively diffused throughout the cellular interstices. The very fibres of the muscles seem sodden in it. I have seen even the heart pale, flabby, and inelastic, as if soaked. It fills the sub-cutaneous cellular tissue—that which surrounds the muscular fasciculi, and that which is arranged about the tendons, joints, etc. The pressure of the fluid sometimes occasions the condensation or absorption of the viscera upon which it lies. In hydrocephalus the brain is sometimes distended into a thin, pulpy bag, by the filling of the ventricles; sometimes compressed or absorbed so as to appear a mere lump, by the weight of serous fluid effused on its outer surface. A similar compression of the lung may take place when there is much deposition within the thorax. It may also distend the loose cellular substance of this viscus—the anasarca pulmonum of Sæmmering.

Symptomatic dropsy, as I have already said, is found connected with every variety of organic change in the affected viscera. None of these, therefore, can be regarded as definite or characteristic, although much has been urged in favor of thus considering the nephritic derangements. Yet these also are exceedingly varied and uncertain. The kidneys have been found wasted or atrophied, soft, hard, lobulated, tuberculated or scrofulous, schirrous, granulated, presenting concretions sometimes, and sometimes hydatids, or vesicles resembling hydatids

both in their substance and on their surface. In old dropsical subjects, I have found the kidneys much diseased. The ureters were of uncommon size, capable, in one, of admitting the finger, and the pelvis of the organ dilated into a considerable sac. They presented a confused structure, thickened and hardened. In several, hydatids had, as it were, burrowed in the external surface, from which they were readily drawn out when the membranous coat was peeled off.

The Diagnosis of dropsy is not often uncertain, when general or universal. The early stages of some of its forms may be occasionally difficult to detect, or indeed may be almost inseparable from the varieties of local disease upon which they may be dependent. To determine with accuracy, however, whether a serous effusion is the mere result of some local affection, inflammatory or otherwise, or whether it is engrafted upon, and a portion of, the true hydropic diathesis—this is a question of great nicety, and bears very closely on the prognosis in any given case. It is also a matter of great importance in its influence upon our treatment, to know the nature of the modifications impressed, both by the varied conditions of the constitution, and the character of the cause which has produced the attack. It would be unreasonable to anticipate, from the almost infinite diversity of the causes of dropsy, of which we have given above a brief and imperfect enumeration, anything like uniformity of effect. A proper attention being paid to this obvious truth, we shall be enabled, in some measure, to reconcile the vast discrepancies to be found in the essays of practical authors, as well as to avoid the gross errors so often committed from inadvertence, on the one hand, and the obstinate adherence, on the other, to exclusive views of the subject. Those who persist to regard dropsy as of course dependent upon direct debility, add fuel to fire often by the ill-timed employment of stimulants and tonics; while others, viewing it as essentially inflammatory, are no less apt to commit a fatal mistake in depleting largely patients already sunk into the lowest stages of vascular prostration. We must never neglect, then, this practical division of dropsies into entonic and atonic—the first, implying the remains at least of the ordinary vigor and elas-

ticity of constitution, if not of some definite degree of morbid excitement; the latter, denoting the opposite condition of remarkable debility.

We should next enquire into the probable connection of the hydropic effusion with organic lesions, the seat of such lesions, and their nature. In these enquiries, much stress has been laid upon the coagulability of the urine discharged by the patient. That the presence of coagulable urine is often associated with disease of the kidney, is proved by Dr. Bright's cases; but this coincidence is by no means invariable. Prout regards it as indicative rather of an irritative state of the system, while others deduce from it the inflammatory character of the disease. It is, indeed, oftenest met with in acute cases, as they are called, invading rapidly as the result of some recently applied cause, as anasarca from scarlet fever. For my own part, I have not been able to draw from it any clear or positive inferences, either as to the nature of the attack, its causes, or its remedies.

The habits of the patient—the tendencies of the climate in which he lives—the history of the maladies by which he may have been affected, ought to be known, to enable us to understand fully his condition. I have not met with a single case of general dropsy in which the abdominal effusion was the first to show itself, where I failed to trace the presence of hepatic disease, whether the result of exposure to malaria, or of intemperance in drinking. To the latter mode of causation, we must very often—though surely not always—ascribe dropsies with early and prominent thoracic effusion; and here, too, the liver will be found schirrous or tuberculated, or excavated with abscesses. I would be more apt to look for nephritic disorder or degeneration when anasarca preceded. You will observe, that in order to avoid the possible confusion between local—so called—and general dropsy, I apply the latter phrase to those instances in which the existence of the hydropic diathesis is shown by the concurrence of the three forms or localities of serous accumulation, anasarca namely, ascites, and hydrothorax.

The general Prognosis in dropsy is decidedly unfavorable. In the bills of mortality published in our country, it will always be found to occupy a conspicuous place, presenting annually an average number of victims inferior to that of no other malady;

consumption alone excepted. In frequency of occurrence, and in difficulty of cure, it is alike remarkable.

The special Prognosis varies with all the diversities of condition and habit of the patient—the circumstances which have preceded the attack—and the nature of its probable cause. It is also influenced by the locality of the effused fluid, and by the importance of the organs whose lesion may have produced it, and with the proper performance of whose functions it may interfere mechanically or otherwise, as in hydrothorax and hydrocephalus. Cases that have progressed to the full development of the three forms which go to constitute or denote what I have called general dropsy, are very rarely curable—perhaps they may be affirmed to exhibit a fatal tendency with as few exceptions as are to be found in any other variety of disease. While the effusion occupies but a single seat, on the other hand, we are permitted to entertain hopes of success proportioned to the chance of removing the cause. In entonic attacks, resulting from transient influences, as after the exanthemata, there is no very great difficulty in the cure.

To the views given above of dropsy, generally considered, our Treatment must of necessity correspond. In a disease confessedly so obscure in its nature, and liable to be produced and modified by such an indefinite variety of contingences, we must avail ourselves of all attainable information concerning the constitution and previous life and habits of the patient, the diseases of which he has been the subject, and the medicines which he may have taken for their removal. If he is young and robust—if the attack has supervened rapidly after some exposure, or the application of some obvious cause—if the pulse be firm and strong, and, still more, if there be any tokens of inflammatory irritation in the part where the fluid is collecting, the morbid vascular excitement will require to be reduced by the usual antiphlogistic measures, among which the lancet certainly holds the chief place. To the same class of cases, the drastic purgatives and the sedative diuretics are well adapted; but surely I need not caution you against the indiscriminate employment of such efficient remedial means. If called to a patient whose languor and paleness told of protracted weakness and disease—whose pulse beat feebly, and whose failing powers were scarcely

sufficient for the ordinary movements of animal life, you would be compelled to resort to a regimen directly contrasted with the above. Stimulants and tonics are here absolutely necessary in such forms and combinations as may be most promptly and effectually adapted to restore the impaired strength and exhausted vitality.

Yet, let me remind you of the unfortunate tendency of our profession to prescribe—and, perhaps, more peculiarly in this familiar case than in any other—rather for the name of the disease than for the actual condition of the patient. I can truly say, that I know of no malady in which so much evil is done by the misapplication of powerful medicines. The lancet, mercury, digitalis, and the most violent cathartics, are in the hands of every one, and are widely used in the most indiscriminate and empirical manner. But these heroic remedies cannot be expected to be neutral or indifferent in their effects. If the sufferings of the sick be not relieved, they must be aggravated by them—their use must be followed, with little delay, by recovery or fatal prostration.

There needs but one observation to convince you of the unfavorable state of medical practice in dropsy. On looking through the books of best authority on the subject, and conversing with physicians of most extensive experience, you will read and hear of such an infinite variety of remedies and of plans of treatment, and even of so called specifics for its cure, that you will not hesitate to infer the weakness of each, and you will be satisfied that our hopes of overcoming this formidable disease depend, not upon the peculiar virtue of any among the numerous articles thus brought forward with undistinguishing eulogy, but upon the attention, judgment, and skill of the practitioner in the proper selection and the due application of each to the particular circumstances adapted to its beneficial operation.

One of the most recent and respectable writers on dropsy has laid down the following general rules for our treatment of its several forms. "If," says Professor Graham, "we produce upon the constitution the effect we have reason to look for, and the disease remains as before, then we have indeed fairly tried the prescription, and have sufficient reason to conclude that our treatment is inapplicablé. If we direct purgatives, and succeed

in opening the bowels freely, without relief, then we have reason to think that cathartics are not suited to the case. If we employ bloodletting, in a patient with a full, hard pulse, however large the quantity may be that we take away, we do not try the remedy before we have produced its usual sensible effects, before we have brought down the fullness and strength of the pulse; but if we have done this, and the disease continues unabated, then we are justified in changing the treatment." Nothing can be suggested more purely empirical than these directions, or exhibiting a more melancholy absence of any pathological or therapeutical principles. The management of the case is a series of successive experiments, during which, the condition of the patient is only referred to, as denoting the propriety of perseverance or abandonment, and by no means as forming the governing inducement in the requisite selection of remedial means.

"What can the reader conclude?" exclaims Dr. Blackall, after reciting a lamentable diversity of opinions of some of the most esteemed names of the profession, concerning one of the forms of dropsy—"What can the reader conclude, but that nothing is known of this disease, and that in its treatment the most powerful instruments are wielded in the dark."

From the time of Sydenham, and even perhaps among the earliest of his predecessors, the attention of the physician has been almost exclusively directed to the mere evacuation of the effused fluid. To accomplish this purpose, seemed the whole of his task; the means for effecting it, were the grand desideratum. These assumptions were, indeed, natural and obvious, and it was scarcely less so to look to the kidneys as the proper outlet for all such accumulations. The scantiness of the urine in a great majority of cases, could not escape observation, especially as the patient, tormented by an unquenchable thirst, is apt to indulge in large and frequent draughts of water. Hence arose, and plausibly enough, the notion, even now prevalent, of a direct connection between the deficiency of this excretion and the collection of watery fluid in the several cavities. Strength was added to this opinion by the physiological experiments, which went to show that the kidneys gave passage out of the body to almost all the extraneous matters which in any way find admission into it, whether by digestion or simple absorption. Diure-

tics have, hence, for a long while, borne the palm among the remedies for dropsy—a preference which would undoubtedly be well deserved, if the evacuation of the effused fluids were indeed all that we have to desire. The *Materia Medica* abounds in direct and indirect diuretics of such powerful efficacy, and of such diversified influence, that we may venture, in every case, to indulge strong hopes of succeeding thus far in the effort to succor our patient. But, unfortunately, this is not all. I have already alluded to the alternation which is occasionally to be noticed in the excitement of the absorbents and of the exhalents during the continuance of dropsy, numerous instances being on record, in which there was a rapid disappearance of all the watery swellings, either spontaneously or as the effect of medicines, followed but too often by as rapid a re-accumulation. Nay, it is perhaps in the worst cases and in the lowest and most debilitated states of the system, that we shall find it most easy to get rid of the serous effusions at such intervals; but this, you will readily perceive, so far from curing the patient, is scarcely—to speak with pathological correctness—taking a single step towards his cure. To prevent the return of the hydropic intumescence—to remove the tendency to the re-accumulation of fluid—to relieve the constitution from that state of which this tendency is a part—in other words, to do away with the dropsical diathesis, and to restore the organs diseased in whatever manner, infiltrated and oppressed, to their previous condition—these are the problems before us of difficult solution—these are the indications, which must be answered, in order to the recovery of the patient and the resumption of health.

Our plans for the accomplishment of these objects, are all vitiated by our ignorance of the nature of the disease, and our embarrassment under the infinite diversity of contingencies presented in its history. Similar effects seem to arise not only from dissimilar, but from apparently opposite causes; and the effusion which, in one subject, we attribute to inflammatory violence of vascular action, and endeavor to remove, by the most unsparing depletion, in another, we ascribe to relaxation and debility, and aim at relief by the diligent use of tonics and stimulants.

The diuretic method of treatment, aided occasionally by the

use of hydragogue cathartics, which, by their mode of action on the bowels, give vent also to large serous evacuations, is still the most generally received, and, notwithstanding its undeniable want of gratifying success, and the great comparative mortality of dropsy every where, and in all its various forms, is still confided in, and almost exclusively resorted to by a very extensive class of physicians.

To correct the error implied in this undue attention to a mere symptom, and attain some clear and scientific notions on this important topic, is the object of a recent author, Blackall, whose work on dropsy is entitled to high commendation. One of the favorite doctrines of this respectable writer, is the notion, more than once alluded to, of a precise and definite correspondence between the qualities of the urine, and the condition of the several viscera and of the general system. This correspondence is principally traceable by the degree of coagulability of the urine, a quality which depends on the proportion of serum and of albumen contained in that fluid. The usual mode of testing this proportion, is, by exposing a small quantity of the urine to heat, which, as you know, causes promptly the hardening or coagulation of albumen, as in an egg, for example. I have already given you the received views concerning these points. I think an undue stress has been laid upon them. Yet I would not refuse to accord to the appearance and condition of the secretion from the kidneys, their proper weight as symptoms. I only mean, that I cannot rank them as of paramount importance in their relations either to diagnosis or prognosis.

I deny, also, most unequivocally, that diuretics possess—as so many maintain—any direct or specific power to cure dropsy. It is true, indeed, that the diminution of the watery swellings is sometimes apparently proportioned to the increased discharge of urine; but this concurrence does not prove that they stand in the relation of cause and effect to each other—I rather believe them to be coincident effects of a common cause. Besides, if a diabetes could be thus substituted for the previous hydropic accumulations, (as has been imagined by Blackall to be sometimes the case,)—if the serous effusions could be turned off by the kidneys, as fast as they are poured out by the diseased exhalents, what would your patient gain? Nothing. His ema-

ciation and general debility would go on just as before—nay, he would probably sink more rapidly under diabetes than dropsy. What would be said of a cure of ascites, which consisted in offering, by a canula kept in the belly after the operation of tapping, an uninterrupted outlet for the serous effusion, thus prevented from accumulating?

It is a fact that should be kept steadily in view throughout all our discussions on this subject, that all remedies which tend to bring back the system to a healthy and natural state, act in dropsy as diuretics. Those which reduce action when too high, and those which stimulate when it is defective—those which affect favorably the general constitution, and those which address themselves to particular organs whose functions are impaired, operate in a like manner.

Mercury is often our best diuretic. Emetics sometimes produce large urinary discharges—so do cathartics. Bark and Port wine have been employed with the same effect. A case is related by Professor Graham, in which, he says, “it was curious to observe how fully the kidneys did their duty, after depletion, without the exhibition of diuretics. When the patient first came into the hospital the urine was a mere nothing; after the second bleeding, it arose to eight ounces, and in the twenty-four hours preceding the third bleeding, he passed two pints (32 oz.) of water; on the day after the third bleeding, it was two and a half pints (40 oz.); and previous to the great bleeding—seventy ounces of blood!—it was three and a half pints (56 oz.) After that bleeding, it soon got to eleven pints per diem (176 oz.)

I must not be understood to question the propriety of employing diuretics in dropsy—this would, indeed, be an absurd and ridiculous speculation. I propose that you should regard them in the proper light of highly useful auxiliaries, not of remedies demanding your chief or exclusive reliance. It is to be recollected, too, that many of that class possess well known medicinal powers independent of, and apart from, their effect on the urinary excretion, as digitalis, colchicum, cantharides, squill, nitrous æther, and the nitrate and tartrate of potass. A skilful and conscientious physician will never neglect any means of cure that may be in his hands.

CHAPTER XVII.

ANASARCA—CELLULAR DROPSY.

I PROCEED to treat successively of the various forms of dropsy, and first of Anasarca—Hydrops Cellularis—Dropsy of the Cellular Tissue. This distensible tissue is very liable to serous infiltration from a great diversity of causes. Its partial occurrence is known under the title of œdema, and is familiarly met with in local injuries of the limbs and joints, as after sprains and dislocations—in circumscribed inflammations, erysipelalous, phlegmonous, etc. and as arising from vascular debility. Thus, in old age, and in sedentary habits, a swelling of the feet and ankles is often observed to take place in the evening, which, favored by the recumbent posture, may disappear before morning, whether by diffusion or absorption. It also offers itself to our notice among the latter symptoms of many protracted maladies—phthisis, for example, jaundice, asthma, diarrhœa—especially in children—marasmus, etc. Ascites and hydrothorax hardly ever exist long without the supervention of anasarca; but, for whatever reason, it seems most readily and certainly to connect itself with the latter. With hydrocephalus, it does not exhibit any striking tendency to concur, unless in long protracted cases. A metastatic relation has been found to exist between them in a few instances, as I shall by and bye state to you.

It is so frequent an attendant upon some of the exanthemata, that it is proposed to denote it under such circumstances by a special phrase, as consecutive anasarca. Scarlatina is very apt thus to produce it; it also follows small-pox, measles, urticaria, and erysipelas. It is supposed often to depend upon functional disease of the kidney or structural lesion of this organ. The coincidence cannot be denied; but I suspect its frequency to have been overrated.

With the exception of the consecutive cases, which do not seem to be much influenced by the previous condition of the patient, but rather belong to the train of events comprised in the

history of the febrile attack, or the local cutaneous inflammation and its consequence, anasarca seems to me most frequently connected with, if not absolutely dependent on, a feeble and atonic state of the constitution.

In a great majority of instances I am persuaded that the morbid effusion from the minute vessels of the tissue is rather the result of a passive transudation from general vascular inaction, than of a mere increase of the natural action of the exhalents. Indeed, as I have already said, there is no proof of any serous exhalation in the healthy condition of this tissue. Remember, however, that I do not deny the possibility of entonic or even febrile anasarca; but this modification is rare within my own experience.

In ordinary cases of cellular dropsy, the swelling appears first on the lower extremities; the areolæ of the sub-cutaneous membrane communicating freely, there is nothing to prevent the fluid from obeying the common law of gravity. The skin distends uniformly and gradually; is pale and rather colder than natural; the swelling is inelastic, though pretty firm; when pressure is made with the finger, pits are formed, which slowly disappear. The distention becomes more and more general, affecting at last the trunk and face, until the peculiarities of countenance are in a certain degree lost, and in extreme cases the features bloated and confused into a doughy mass. In certain parts of the body whose structure is lax and dilatable the intumescence becomes monstrous, as in the penis and scrotum. It is not only in the sub-cutaneous cellular membrane that the effusion takes place; it is said to occur, within the same tissue, whether interposed between muscles, forming the sheaths of the vessels and of tendons, or surrounding joints, or elsewhere disposed. To such an œdematous condition of the lungs—a state, indeed, to which the term *anasarca pulmonum* has been applied—would I ascribe the dyspnoea so often attendant on ordinary cellular dropsy, and productive of so much additional distress to the patient.

It must not be imagined that this deposition of serous fluid with its very great mechanical inconveniences constitutes the whole history of the disease under consideration. Far from it. Coincident with the appearance of dropsical swelling and, in

many instances, previous to any notable distention, the general health of the patient is obviously impaired. He complains of languor and incapacity—both bodily and mental—and undergoes great fatigue with frequent faintness, from slight muscular exertion.

Hence he becomes indolent, unwilling to move, drowsy and vertiginous. There is gastric uneasiness with loss of appetite and in many instances occasional vomiting of foul porraceous matters, or an offensive mucus. The tongue is pale and sodden, coated with a whitish fur. The skin is dry and harsh generally, though in some it is relaxed and moist. The thirst is usually tormenting. The bowels are for the most part torpid and the dejections little changed. The urine is scanty and high colored, especially when there is present any febrile irritation. The pulse varies much, being usually frequent, quick and soft. In acute and entonic cases it may be met with tense, hard and abrupt. Such is the condition of the patient in exanthematous anasarca in certain instances. Here the tongue is red—the thirst great—there is dyspnœa—the urine is scanty and albuminous—the effusion increases rapidly, and the distention is apt to be promptly attended with cutaneous inflammation in depending parts.

When anasarca goes on unrelieved, the patient sinks at last under the exhausting oppression of the organs with whose functions the effusion interferes, either by infiltration into the cellular tissue which forms a portion of all of them; or by its exhalation into the serous cavities, thus developing general dropsy; or under the ceaseless irritation arising from the distention of the skin, which cracks, vesicates and ulcerates in a loathsome and distressing manner.

The Prognosis in anasarca, I need scarcely repeat, is generally unfavorable. In cases of the consecutive character it is less so than in the other forms—with a single exception. In fact it may be doubted whether these cases are (at least in the early stages) identical in their pathology, or proximate cause, with true anasarca dependent upon the hydropic diathesis. They seem to me to be in a certain sense merely local, as being the result of a temporary impairment of the function of the cutaneous integument from recent and previous inflammation. Besides, such attacks

present very generally an entonic condition of the system and occur—a large majority—in early life, when the recuperative powers of the constitution are vigorous and elastic.

There is another variety of anasarca, not very rare among us, in which I would also venture upon a prognosis generally favorable. It is almost exclusively met with in our black population, and seems to arise from disorders in diet, conjointly with their entire neglect of proper ablution of the skin and change of clothing.

The Causes of anasarca are not very definitely made out—or rather so many have been enumerated by authors, that we have lost sight of their relation with their alleged effects. A majority of them have been already mentioned incidentally. Besides these, exposure to damp and cold air—pulmonary affections, perhaps from their checking the large watery exhalations from the respiratory surfaces—diseases of the kidneys—inordinate evacuations, such as large losses of blood in the treatment of disease, by accident, or by hemorrhages, especially in the states of pregnancy and parturition—lencorrhœa—serous diarrhœa, especially in children, and worms—may be briefly specified.

The Treatment of anasarca will, of course, require to be modified by the various contingencies alluded to, as forming such prominent parts of the history of the several cases. The apparent cause, the permanent constitutional peculiarities of the patient, his habits of life, his recent history as to exposures, attacks of disease, and remedies employed for their removal, must all be taken into due consideration. In entonic anasarca, you will resort to antiphlogistic measures. The lancet may be occasionally of service, though I think you would be misled in its application to dropsy in our climate, by yielding to the guidance of European and Northern writers, who report favorable results from venæsection, repeated again and again, and very large destractions of blood. This kind of depletion has been badly borne by anasarcous patients under my care, even in the cases apparently best adapted. While, therefore, I do not forbid blood-letting, I must advise you to great caution in resorting to it.

Equal advantage, with far greater safety, may be obtained from the class of cathartics, among which some selection is necessary. The hydragogues, so called from the fact that they

not only effect the evacuation of the contents of the bowels, and stimulate the collatitious viscera, but by their peculiar influence upon the exhalent vessels opening upon their internal surface, solicit from them large, thin, and watery discharges, have been on this account, regarded as peculiarly suited to the present case. There are many of these. The most confided in are elaterium, scammony, colocynth, gamboge, jalap, the seeds and oil of the croton tiglium or bastard ricinus, several of the neutral salts, especially the sulphates of soda and magnesia, and the supertartrate of potass. The first of these—elaterium, requires to be employed in small doses; scammony and colocynth are not only exhausting, but produce much intestinal irritation, if not well guarded. Gamboge and jalap are nauseating, and by depressing the digestive powers, tend much to exhaust the strength of the patient. I have seen more than one patient, as I fully believe, literally purged to death by the use of these harsh drastics, and therefore, again press upon you the necessity of attentive caution. Gamboge seems to me the safest of them, in proper quantities, and in judicious combination—best with the spts: nit: dulc:, for it is so apt to become emetic if offered in too large amount, that its debilitating influence as an evacuant is thus often prevented.

For the most part, we shall gain as much, with far less risk, by the exhibition of the neutral salts. Solutions of the sulph: magnes: or the sulph: soda, may be combined with such other remedies as are thought proper to be given. But the cream of tartar—the supertartrate of potass, is the article most commonly administered and most universally confided in. To ensure its cathartic effect, it should be mingled with some one of the resinous purgatives. Jalap is usually selected, and though this formula deserves the high recommendation so universally accorded to it, when well suited to the condition of a patient, yet it is right to warn you, that in debilitated subjects, the reduction of the general strength and vital power may go on quite as rapidly as the diminution of the dropsical swelling, expected to be consequent upon the large discharges of watery fluid from the intestines.

The croton tiglium is by many asserted to be freer from the risk of inducing prostration of strength, than any other of the

class of hydragogue cathartics. It possesses the advantage of concentration, the dose being so small as to be very easily taken. Indeed it is affirmed, that if the oil is applied endermically, it will often give rise to abundant alvine evacuations, a few drops having been well rubbed in over the surface of the abdomen.

Emetics, which formerly enjoyed an almost unlimited reputation for the cure of dropsies, have of late, fallen into unmerited disregard. While the theory prevailed, which ascribed the serious collection to a deficient action of the absorbents merely, they were much relied on as being strongly efficient in exciting absorption. But it is not in this way that I account for their usefulness. I have already mentioned the tokens so frequently to be met with, of a depraved state of the digestive organs in dropsy, the foul tongue, the oppressed and nauseated stomach, the constipation, etc. These symptoms are often promptly removed by an active emetic, an antimonial especially, which not only relieves of its load, one of the most important of our organs, but by the concussion given to the whole of the abdominal viscera, discharges them, promoting a free circulation of blood through their vessels, thus carrying off such obstruction as may be present, and communicating a beneficial excitement to the whole vascular system. Dirt eating among our blacks gives rise to a species of cachexy, on which anasarca is an almost constant attendant. In such instances, the repeated use of emetics is our very best method of treatment, if indeed it be not indispensably necessary to a cure. They bring away immense quantities of a vitiated mucus from the depraved stomach, and thus promote in the promptest way, the restoration of the lost tone of the organ, and the substitution of a natural appetite for the morbid and brutal desires now become habitual.

Diaphoretics are particularly, though by no means exclusively adapted to dropsies of febrile character. Their good effects have been, strangely enough, ascribed to a sort of reversed influence upon the kidneys, but I think are much more reasonably to be attributed to their general action upon the circulatory system, by diffusing vascular excitement where there are morbid determinations to, and engorgement of particular viscera, and by directing it to the skin and promoting cuticular transpiration, almost always deficient. It is in this way that the hot and va-

por baths do good service. Even cold water, made in any way stimulating, as by the addition of various salts, is often useful, and sea bathing has been much recommended.

The several snake roots, as they are vulgarly called, the seneka, serpentaria, and the button snake root, the *eryngium yuccifolium*, are held in deserved repute. The infusions of the two former are, with great advantage, made the basis of cathartic solutions of Epsom and Glauber's salts. These mixtures act upon all the excretions, affecting the kidneys as well as the skin and bowels; and form some of our best prescriptions in anasarca.

Antimonials may often be also so managed as to produce this general excitement of the emunctories, and should be employed in cases complicated with febrile irritation. They may be combined, on the one hand, with mercurials in small doses, or with the nitrate of potass, if the strength of the patient be still good, and the circulation vigorous. If on the other hand, there is a disturbed state of the stomach, or the bowels are irritable, we may unite them with opium. This last article, in combination with another of the diaphoretics and emetics—*ipecacuanha*, namely, is often of great use. Dover's powder, indeed, is one of our best diaphoretic formulæ, and may be very extensively administered.

Opium alone, is frequently prescribed with great advantage; Mead and Willis each relate a case cured by it. Heberden, in his Commentaries, says, that he "has known anasarca sometimes cured by opiates, given at night, probably, he thinks, by the sweating they occasioned." Home speaks of their efficacy as established, and proposes as a question, "*Quare opiata urinæ profluvium adaugent et morbum sæpe tollunt?*" The reply to which is readily given upon the principles I have advocated.

In every case where there is present any notable degree of general irritation, troublesome dyspnœa, or morbid vigilance, I do not hesitate to employ some of the preparations of this invaluable narcotic. Its combination with such other medicines as may be judged necessary, often obtains for us their retention upon the unquiet stomach, and promotes whatever effect they may be intended to produce. Blackall affirms, for example, that he has seen the diuretic action of both squills and *digitalis* greatly assisted by opium.

So much stress has been laid upon the exhibition and due management of diuretics, in the treatment of dropsy, and they have been esteemed of such special importance, and indeed, essential necessity, that the treatises of the disease have frequently been little more than encomiums upon this class of medicines, recommendations of particular articles among them, and discussions as to the best modes and circumstances of their administration. They have been regarded as bearing the same relation to the hydropic diathesis which cinchona bears to intermittent fever—not merely as evacuants, but as antidotes. I signified formerly my dissent from these views; but while I deny to diuretics, simply considered as such, any specific adaptation to the present case, I am ready to acknowledge that they are often by their general influence and indirect operation, besides their evacuant powers, of decided and obvious benefit.

That there exists in dropsy a peculiar morbid condition of the exhalent vessels and surfaces, will scarcely be questioned; it will also be allowed that this morbid condition is liable to be modified by whatever modifications of cause and of individual constitution. There is no more uniform symptom of the disease than a general deficiency of the various secretions and excretions; this deficiency, whether dependent on the cause which has produced the morbid effusion, or resulting from the effusion itself, tends to increase it or admit of its increase. On the other hand, the restoration of these several secretions and excretions, by deriving fluids from the morbidly congested surfaces and exhalant vessels, will act revulsively and prove efficient, 1st. in preventing any farther increase of effusion; and 2nd., by affording a ready outlet for such amount of the deposited fluid as the absorbents of the affected surface may take up. And there is, as I have before said, no proof of the torpor so commonly attributed to the absorbents in dropsy. At any rate, there cannot be a doubt that they often give token of increased, rather than diminished energy. Evidence of this is readily found in the rapid disappearance, so often witnessed, of dropsical swellings, followed too often by as rapid a recurrence of them. The vessels being distended and oppressed by the quantity of watery fluid carried into the circulation by the activity of the absorbents, unload themselves *qua data porta*, not by the kidneys only,

the readiest and most natural outlet, I grant, but in any other feasible mode; by the intestines, as when hydragogue cathartics are prescribed; and as I have quoted from Sydenham, under the action of antimonial; and as I shall state, on the authority of Chapman and Caldwell, in a most extraordinary manner, through the cutaneous vessels.

Willan, in his miscellaneous works, relates a singular case strongly in point. He was called to see "a woman of about thirty-eight years of age who was anasarcaous; she was universally bloated, her legs especially being swollen to an enormous size, and there seemed to be fluctuation in the abdomen. After the natural cessation of the menstrual discharge there came on suddenly a flow of water which drained through the bed before she could get assistance, and afterwards filled a vessel which held three quarts, leaving her faint and languid. This evacuation continued in a more gradual manner for two days, when the dropsical effusions had entirely disappeared: within ten days the water had again accumulated, and again the same evacuation took place, and with the same effect; she now went into the country, took cinchona, and completely recovered." Dr. Willan believed, and with much apparent reason, that the discharge here was from the uterine vessels. It is impossible to account for, and difficult to conceive of the prodigious rapidity with which in instances like these, the absorbents under some inexplicable influence, act upon collections of fluid to whose presence they have been previously indifferent.

But farther. The diuretics, so called, do not seem more likely to occasion the profuse excretion of urine in dropsical cases than any other remedies. When they have arisen from visceral obstructions, calomel alone will occasion free discharges by the kidneys; cinchona alone will succeed similarly when debility is the prominent condition. Opium, under some contingencies, tobacco under others, act in the same way.

A still more striking instance, perhaps, of this indirect diuretic operation of well adapted curative measures, is given us on the authority of Mr. Johnson, Surgeon of the Asia East-Indiaman.—"On the arrival of this ship off Canton, the sailors were attacked with dropsy, attributed to the use of damaged rice, upon which they had been obliged to subsist towards the con-

clusion of the long voyage. They were placed, when in port, on a diet of well fermented bread, which operated as a very active diuretic within twenty-four hours after they had begun its use." "No doubt," he says, "remained in the mind of any one, what it was that had performed the cure."

The first article which I speak of, under the head of Diuretics, is cold water. The situation of the fabled Tantalus of the heathen mythology, was realized in the long established practice in dropsy, and the miserable patient tormented by an unquenchable thirst, was forbidden to taste the cup of enjoyment, for fear of adding to the aqueous accumulation in, which was supposed to consist the very essence of his disease. You need not now be told how erroneous the principle, nor how full of injury, as well as suffering, was this most unnatural restraint. Suffice it to say, that water is not only one of the most certain and powerful diuretics, but that it is scarcely possible to obtain the favorable action of any medicine whatever, upon the kidneys, without allowing free dilution.

It is proposed to add to the efficacy of water, as a diuretic, by infusing in it a very great number of vegetables—some of them in common use at our tables. Of these, the garden parsley is, I think, the most to be depended on—the horse radish, the garden and water cress, are also serviceable. The green broom and juniper berry, should be mentioned; the latter is familiarly employed in the Dutch spirit, to which it gives flavor. The root of the artichoke, squill, colchicum, tobacco and digitalis, are most generally trusted to in regular practice. All these I find uncertain in their effects; tobacco, perhaps, least so of them all; eulogized by Fowler, it has also been recommended by Dr. Ramsay, in his Medical History of South-Carolina, as of great benefit in the treatment of dropsies occurring among the blacks in this city, during the revolutionary war. Some preference seems to be due to a tincture prepared from the leaves of the plant rendered crisp, by drying quickly over a fire. The dose seems to be limited chiefly by the ability of the stomach to retain it, or of the patient to bear the oppressive nausea it produces. It is used in substance, powdered—a tincture of the leaf as ordinarily dried, and even the ashes of the plant.

Colchicum is often of great service. I should be disposed to

place particular reliance upon it in cases marked by any tokens of nephritic disorder, or where there had been any previous gouty affection.

The squill is seldom given alone, although many respectable physicians still retain the once prevailing good opinion of it. As expectorant, it is often applied to when there is much dyspnoea or pulmonary oppression. Perhaps it has lost some of its reputation by being administered in ineffective doses. The infusion, in as large quantity as can be borne, seems to offer the best prospect of obtaining its good effect. It is, perhaps, most employed in substance and in combination, especially with calomel and some diuretic salt, as the nit: of potass. If you prescribe it, I would advise you to administer it promptly in a sufficient dose, and by no means to persist long in its exhibition. I regard it as particularly injurious to the digestive powers. "The debility and loss of appetite that result from it," says Blackall, who nevertheless made much use of it, "are often rapid and excessive."

Of digitalis, which is by many regarded as the principal diuretic and chief remedy in dropsies, of whatever character, I would remark, that there is no proof of its being of itself and intrinsically, a diuretic at all. It is a powerful narcotic; it diminishes the force, and in a very striking degree, the frequency of the pulse; it disturbs, in various modes, the sensorial and nervous system, over some of the modes of whose excitement and irritation, it seems to exert a singular control; it nauseates and acts as emetic. Its indirect operation upon the kidneys, in dropsical cases, may be understood upon the principles I have laid down, without ascribing to it any immediate diuretic properties. I have never seen it exhibit any such in diseases unattended with serous effusion. I am in the habit of employing it daily, in pulmonary disorders. I prescribe it in many nervous affections. I have administered it in every varied mode, and in every quantity consistent with the life of the subject. I have seen a patient kept under its poisonous influence for nearly a week, with a pulse about forty—a dilated pupil, a stomach miserably oppressed and nauseated, and great annoyance from hiccup. In cerebral affections of the irritative character, such as mania a potu, somnambulism, and the like, I do not hesitate to give

ʒii or ʒiii at a dose, or an ounce of the sat: tinct: in twelve hours. Yet in no instance have I met with diuresis as a consequence of its exhibition, in any quantity or formula, unless, as I said above, when hydropic accumulation existed.

"If any person," observes Ferriar, "were inclined to write a satire on medical evidence, the different testimonials respecting the properties of this single plant, would furnish abundant materials. 'It is a diuretic,' says one physician. 'It has no diuretic power,' says another. 'It is a stimulant,' says a third. 'It is a sedative,' cries a fourth. 'It has no properties at all!' exclaims a fifth."

After all this idle dispute, however, and amidst all this contradiction, certain points may be considered as fairly established, with regard to the peculiar influence of this medicine, and I shall proceed to give you impartially, the results of observation and experience on the subject. Coupled with the energy to do good, must always be the liability to become an instrument of evil, and the enthusiastic and indiscriminating encomiums on digitalis, which have been published in such numbers, have undoubtedly done much harm. Digitalis is supposed to be peculiarly susceptible of having its effect on the system modified by combination with other remedies, and hence was derived the recommendation echoed by so many, from Paris down, that it should always be administered alone. The rule is unquestionably a good one, yet it admits of occasional exceptions. When there is hepatic or other visceral obstruction, calomel may be added with much advantage; nay, I have seen combinations with some of the cathartics, attended with immediate effect upon the kidneys, as soon as the bowels had been freely opened.

Dr. Withering has advocated the opinion, which indeed, receives the general assent of physicians, that this narcotic acts most favorably in the dropsies of low, feeble and lax constitutions, when the complexion is pale, the pulse weak and small, and the solids flabby. Darwin maintains, that it is peculiarly adapted to the cases of old drunkards and debauchees. It seems to be far less useful, (if at all,) in entonic dropsy, connected with vascular excitement or febrile irritation, when the pulse is

chorded, the strength good, the tongue red, and the skin hot and dry.

Beyond the inferences drawn from these remarks, no positive rules can be given for its administration. I am inclined to think that the medicine often fails to produce its good effect in dropsy, from being administered in too small doses, and that it does harm in the hands of some physicians, from being persisted in too long. In a former lecture, I took occasion to speak of the accumulative influence of certain medicaments, mentioning digitalis as an example under that head. To obtain its beneficial action as a diuretic, it demands to be given in as large quantity as the stomach and nervous system will bear—the infusion being the preferable mode, and next to it the powder of the leaf. It does not require any great length of time to act upon the kidneys, and therefore I would advise you to discontinue its use, if after a few days—from seven to ten, there is not an obvious increase of the quantity of urine discharged. By and bye, it may be offered again, and by this intermission you are sure to avoid all evil results.

In the more atonic or asthenic attacks of anasarca, it would perhaps, be better to substitute for the narcotics and nauseants, of which we have been treating, the more stimulating diuretics. *Serpentaria* and *seneka* are much used, and the latter will often be found very serviceable, especially if combined in substance with the nitrate of potass, or in infusion with nitrous æther. The *eryngium yuccifolium*, known to the common people as the button snake root, is in high repute here, and I have seen its exhibition attended with signal good effect. *Cantharides*, both in powder and tincture, have been employed with advantage. When there is nothing in the condition of the stomach or general system to contra-indicate so impressive a stimulant, it well deserves a trial.

Among the saline diuretics, are also found many articles of considerable value in the treatment of dropsy. They are, it should be observed, better adapted to the management of the disease in its acute and sub-acute, sthenic or entonic forms. Among them we may enumerate the carb: sodæ, the carb: subcarb: and acetate of potass,—the latter of which, indeed, is called,

by way of distinction, in the old books, *sal diureticum*; I think the nitrate quite equal to it in power;—so are, according to Dr. Heberden, the “soluble tartar” tartrate of potass, and the Rochelle salt, tart: potass et sodæ. Of all saline diuretics, however, that which is looked to with most confidence, and spoken of with most unqualified eulogy, is the super tartrate of potass—the *cremor tartari*. I cannot help admitting the claim preferred for it by both Home and Ferriar, of being the most certain of all diuretics. Yet I by no means concur in the general opinion of its peculiar harmlessness and safety; on the contrary, I believe that no patient can continue to take it for any great length of time without injury, unless in a condition of obstinately high febrile excitement, a state of the system which seems to resist its evil influences. In asthenic subjects and atonic cases, it ought to be abstained from, or used rarely, as a hydrogogue cathartic only. When persisted in as a diuretic, I have seen it more than once bring on a total loss of the tone of the stomach, with sudden and irremediable prostration.

A very important portion of the treatment of anasarca, will often be found to consist in the proper management of tonic remedies. Of these, the principal doubtless is exercise, which is affirmed by Cullen to be of itself sufficient, sometimes, to remove or cure the disease in its early stages. There is, however, as has long been matter of familiar observation, a peculiar languor, heaviness and somnolency attendant on dropsy, with great indisposition to any species of muscular effort. It is necessary, therefore to entice the patient to such exertion, or to institute peremptory rules for his government. An agreeable journey may be proposed; a visit to different places of fashionable resort; riding and sailing parties; and some of the athletic sports, under shelter, provided for inclement weather. Of all these modes of exercise, however, those are to be preferred which imply most muscular action with greatest circulatory excitement; you must all have noticed the disappearance of œdematous swellings of the lower limbs after a brisk walk. The restoration of the functions of the cutaneous vessels, will be much aided by frictions on the surface, which should be stimulated twice or three times a day, by the smart application of the flesh brush.

The cold bath has also been proposed with the same view,

and will be productive of obvious benefit, provided there be still sufficient elasticity in the cutaneous vessels to exhibit a ruddy warm glow immediately. This is both the mode and the test of its utility; if the patient be chilled by it, we must not repeat it. Under the idea, founded on well known physiological facts, that dropsical swellings were increased by cuticular absorption of moisture from the atmosphere, the use of the tan bath—the infusion of oak bark, has been employed, and it is asserted, with decided advantage, as an astringent tonic. Flannel should of course be always worn next the skin.

Of the mineral tonics, iron has been generally preferred. The Italian physicians regarding it as a contra-stimulant, however, consider it best adapted to the acute or entonic forms of dropsy. They administer the sulphate of iron in such cases in almost incredible quantities. Beginning with a few grains, they increase the dose to $\mathfrak{z}\text{i}$. or $\mathfrak{z}\text{ii}$., twice or thrice a day. Instead of augmenting the febrile symptoms, they assert that it lowers the pulse, increases the urinary discharge, and all the other secretions and excretions—thus removing the dropsy and improving the constitution at the same time.

Among the vegetable tonics cinchona is unquestionably the best. A form of anasarca often occurring in our black population has been mentioned and ascribed to causes, which tend concurrently to depress the general vitality of the system and injure the powers of the digestive organs. This I have found best managed from the beginning by the use of cinchona in free doses, the bowels being kept open by the addition, when necessary, of proper quantities of rhubarb or jalap. Blackall relates several instances in which the morbid appearances of the urine were completely changed by a course of cinchona, and the disease speedily removed. When the bark offends the stomach, it will be well to combine with it some aromatic—camphor, ginger, and the like.

Cullen's commendation of bitters has been already quoted. It will occasionally be found of advantage to mingle the gentian, colombo, etc., with our hydragogue cathartics, or with the diuretics which we are exhibiting.

The distention of the skin is the source of intolerable inconvenience to the anasarcous patient—and if timely relief be not

afforded, will produce inflammation, vesication, foul ulcers, and even gangrene. I see no reason to hesitate as to the propriety of scarifications. If these be made slightly with a clean sharp lancet, there is little danger of the ill consequences upon which some writers have laid such stress, but which I have never met with. The skin of the instep and around the ankles is most swollen, and the punctures should be made there. The penis and scrotum will sometimes require this relief.

These little wounds, if inflicted in the morning, will give vent during the day to much water, and the skin having thus become relaxed they will heal during the night, favored by the recumbent posture.

It is astonishing what quantities of fluid will escape at those orifices, not only with great relief to the local sufferings of the patient, but often with decided general advantage. Blackall found the qualities of the urinary discharge perceptibly improved by it—and the quantity of the excretion is sometimes augmented.

Acupuncture has been substituted by some timid physicians for scarification with the common lancet, and no doubt answers the same purpose very well.

For the prevention or cure of the inflammation and ulceration which sometimes follow the cutaneous swelling, it will be proper to apply the gentle restraint of an equable elastic bandage. We thus give the requisite support to the integuments of the lower extremities, which must not be allowed to remain in a dependent position. Foul or gangrenous ulcers must be washed with some spirituous or stimulating lotion, and protected by the application of soft poultices. Charcoal, yeast, or the chlorides, may be used to correct the offensiveness of the discharges.

The diet allowed should be always nourishing. If the patient be in an asthenic condition, stimulating food and drinks may be offered. Certain condiments are supposed to be useful, as onions, garlic, horse-radish, etc. Similar properties are also ascribed to particular drinks, as cider, spruce beer, porter and good Hollands.

CHAPTER XVIII.

ASCITES—ABDOMINAL DROPSY.

ASCITES consists in a collection of serous fluid within the cavity of the peritoneum, whence it might be called with propriety Peritoneal Dropsy. We should thus distinguish it from the encysted watery tumors, as of the ovaria, etc., which are occasionally met with in the abdomen, as well as the rare disease, hydrometra, or watery distention of the uterus. These local affections should never be confounded with dropsy, from which they differ essentially in nature, cause, history and treatment, and, so far as I am aware, are entirely unconnected with the hydropic diathesis. Generally speaking, I am inclined to regard them as parasitic in their character and of hydatid origin.

A gradually increasing swelling of the belly, attended with a sense of weight and fulness, and, for the most part, with obvious fluctuation, marks the presence of ascites. The distention is at first perceptible only in the erect posture, and most, when leaning slightly forward, disappearing when the patient lies on his back. Either previous to, or soon after this symptom is noticed, the general health will be found to be much disordered. There is languor, inactivity, drowsiness, yet the sleep is not sound, and is apt to be disturbed with nightmare or dyspnoea. The appetite is lost; perhaps nausea occurs in the morning—the bowels are usually costive—the urine scanty and high colored—the skin dry and harsh. In the more asthenic attacks, the surface is cold and pale; but it is most frequently the fact, that there supervenes a degree of irritative fever, more perceptible in the evenings, with a quick and corded, though small pulse. The tongue is coated with fur, though sharp at the point and darkly red at the sides. The muscular strength is impaired—respiration becomes impeded by the pressure of the accumulating fluid upward against the diaphragm; after a time, anasarca comes on, and often hydrothorax also, and the patient sinks, worn out by a train of sufferings which it is painful,

indeed, to witness, and impossible to describe, in all the varied modes of infliction.

The causes of Ascites are, speaking of a large majority of instances, more obvious than those of the other forms of dropsy. It is seldom Idiopathic as contradistinguished from the consecutive, but is truly so in the Pathological sense, as indicative of a peculiar state of constitution or diathesis. It is connected, in different individuals, with all forms of local visceral organic disease, none of which, therefore, belong to its essential or characteristic history. The peritoneum, from whose wide internal surface the effusion takes place, is spread over a great number of viscera whose functions are diverse—whose structure varies greatly, and whose disorders are very different. Yet Ascites has been found associated with all the modifications of disease which affect every one of these organs.

In our malarious region, it is often attendant upon hepatic inflammations and obstructions; it follows jaundice—it results as a consequence of protracted intermittents, either from the direct effect of these fevers upon the system, or indirectly from the enlargement of the spleen, so often observed to occur. Many examples have lately been collected of its apparent dependence upon nephritic affections. It supervenes upon chronic peritonitis, dysentery and diarrhœa; in children, often follows scrofulous disease of the intestines and mesenteric glands. It is not unfrequently ascribed to interruptions of the menstrual secretion in women, from whatever source, and is produced by the mechanical irritations and obstructions of the pregnant state; large losses of blood give rise to it, whether accidental or spontaneous, and in this way I would account for its occurrence after parturition. It is one of the most frequent results of intemperance. It comes on promptly after the repulsion of cutaneous eruptions, and constitutes one of the train of evils in the history of the exanthemata. It sometimes invades rapidly, being attributed to the influence of cold and moisture conjoined, and to the excessive ingestion of cold fluids, especially if the body be previously heated and fatigued.

Professor Chapman, of Philadelphia, affirms, that he has seen flatulent colic succeeded rapidly by dropsical effusions within the belly. He supposes, that, in such instances, the exhalent

vessels of the peritoneal surface, give out large amounts of a gaseous secretion, which promptly condenses into the serous fluid of Ascites. A striking example of this sort occurred under my own care. A patient laboring under dysentery, was suddenly distended with air, a true tympanitis which subsided into dropsy within twenty-four hours.

Diagnosis. It is of importance to distinguish Ascites from the state of pregnancy in women—from tympanitis—from the encysted dropsies or serous tumors within the body, and from the physconiaë, under which term are comprised the enlargements of the several viscera contained in the abdomen. These visceral enlargements are irregular in form, occupying one side or the other, usually moveable, hard and inelastic. Tympanitis is tense, but light, and returns upon percussion the peculiar sound from which its name is derived.

In peritoneal dropsy, we attend to the subsiding of the prominent belly when the patient lies down—the fact that it has increased equably and from below upwards. These symptoms will separate it from encysted dropsies, so called—besides, that these latter show rarely and by mere accidental coincidence any connection with the general deterioration of health, which belongs to the history of Ascites.

Fluctuation of the fluid in the cavity of the peritoneum, may almost always be felt, and even heard, both by patient and physician. The latter will be most sensible to it, on pressing his fingers pretty firmly against one side of the belly, and striking the opposite side with a quick, smart tap.

It is sometimes difficult to distinguish ascites from pregnancy, especially when it is the result of amenorrhœa, or other uterine disorder, and mistakes are recorded, as having been made by the most experienced and skilful practitioners. For the special signs of pregnancy, which are detailed to you from another chair, you must enquire with diligent attention, not forgetting to institute a stethoscopic examination, which, in some instances, will prove decisive. When these signs cannot be detected, and more confidently, if there be present the usual marks of the general hydropic diathesis, you will regard the case as one of dropsy. Indeed, the two conditions not unfrequently concur, and prove highly embarrassing.

The general Prognosis is rather unfavorable in abdominal dropsy. In particular cases, it will require to be formed upon a consideration of the patient's state of constitution, age, habits, and the history of the cause or mode of origin, if it can be made out. We entertain the best hopes, where the attack has recently been developed in a young subject previously healthy, as the consequence of some obvious influence transient in its action, as when it has followed one of the exanthematous fevers or some acute inflammatory disorder of the abdominal viscera, and when the system still retains a fair proportion of its elastic energies. In the contrasted class of asthenic or atonic dropsies, coming on slowly, with chronic derangement of the functions, especially if anasarca or hydrothorax supervene, there is little chance of recovery.

The treatment of ascites is to be guided by the principles already laid down in the preliminary lecture on general dropsy, and stated, in detail, while we were considering the subject of anasarca. But as the abdominal effusion very rarely precedes the other, even in the best marked instances of the hydropic diathesis, without being connected directly or indirectly with some functional or organic derangement of one or more of the viscera, we must give our special attention to such probable form of local disease.

Under these circumstances, we must place our chief reliance upon mercurial remedies, whose deobstruent and alterative influences seem essential to our success. Aiming at the slow and permanent effect which they are to produce, we must administer them in small quantities, and in the mode least irritating and debilitating. There is no need of carrying out this plan to the extent of ptyalism, nay, I have, I think, observed that salivation detracts from its benefits. Cautiously watching your formula, therefore, it will be proper to intermit its use, or desist from it for a time, as soon as the least sponginess of the gums or tenderness of the teeth shall become perceptible. Let me warn you also, that in the worst contingencies, the most atonic cases, the most asthenic condition of the patient, you will find him most liable to be acted on by mercury, as a sialogogue. In one such instance, I was very much annoyed by salivating a man of mid-

dle age, with five grains of calomel, pretty severely. He was laboring under both hepatic and splenic enlargement. Your mercurial should be administered, not alone, but in such combination as may be indicated—with opium, squill, digitalis, etc., and should be occasionally left out of your prescription, while they are continued. If calomel prove purgative, or otherwise irritating, the blue pill is almost of equal utility.

On the same view of directly relieving the abdominal viscera, we must determine to the surface by revulsives. It may be proper to premise the application of cups or leeches to the belly, if the surface be painful or tender on pressure, or any inflammatory enlargement of liver or spleen be observed on examination, which should be made carefully and repeatedly. In obscure cases, attended with febrile excitement, it is also proposed to leech and cup the loins, so as to relieve the kidneys from congestion or inflammatory irritation. This will be more definitely indicated by feelings of uneasiness in that region—urine high colored or tinged with blood—or showing, by readiness to coagulate, an undue proportion of albumen. These means of topical depletion having been instituted, we may find much advantage from the employment of fomentations and poultices. Gentle and long continued friction with warm oil over the whole surface is said to prove in a singular degree diuretic, and to give much solace to the uncomfortable sense of distention.

Blisters have been highly recommended by some writers. They may unquestionably be indicated as very powerful revulsives where there is visceral enlargement and engorgement, and where there still remain tokens of internal inflammation, as shown by local fixed pain, or a sense of heaviness in any part. They are eulogized, however, as evacuants of the watery accumulation in the cavity, an effect which I would by no means expect from them, nor know how to account for. A very wonderful story is related by Dr. Caldwell, in his edition of Cullen's First Lines, of the escape of a vast quantity of fluid, sixteen quarts, as he calculates, from the abdomen of a lady, by means of, and through a blister (the second) applied upon the stomach. The effect here is inexplicable and astonishing; he himself remarks, that "the case is unique—the records of medicine offer

no parallel." A second instance, of similar nature, has since been referred to by Professor Chapman, in a late edition of his *Therapeutics*.

It would be unnecessary to take up your time with a repetition of the details of the management of dropsy, given in speaking of anasarca, and equally applicable here. Ascites, however, it should be observed, is more usually of the entonic character, than anasarca, and more generally connected with those modes of excitement, local and general, which bear and require depletion. The lancet, then—the hydragogue cathartics—emetics and diaphoretics, may be used with greater freedom, though still with a due degree of caution, and an unremitting regard to the actual condition of the patient.

No attempt has been made to conceal from you the unfavorable result of a large proportion of cases of ascites, and of the want of efficiency of our remedial management, however skillfully applied or patiently persevered in. When we fail to check the accumulation of fluid by the treatment above laid down—when the absorbents refuse to take it into the circulation, whence it has been deposited, and we are unable to drain it off through either of the natural outlets, the skin, the bowels, or the kidneys, the distention of the unhappy patient becomes intolerable—the integuments of the belly yield to the pressure within, and fissures occur which inflame and ulcerate; it is impossible to lie down or rest from the oppression of the thoracic viscera, and death, with all its terrors heightened by the tedious slowness of its approach, becomes inevitable. Under these circumstances, the operation of paracentesis is proposed, and seems, indeed, so beneficent a method of diminishing the indescribable distress, of which I have just spoken, and has so often been the obvious and unquestionable means of prolonging life, that we cannot but wonder at the determined and unrelaxing opposition made to its performance by authors of high esteem and reputation. For my own part, I do not hesitate to recommend it, not as curative, but palliative—not as exhibiting in itself any tendency to remove the disease, but as almost certainly calculated to relieve agonies which I cannot bear to witness passively, and as affording a more protracted opportunity of obtaining the remedial influences of the treatment resorted to. I am persuaded,

that it is unfair and incorrect, to represent it as likely to sink the strength of the subject, or diminish, in any degree, the chances of his ultimate restoration.

The danger of peritoneal inflammation occurring subsequently, seems to me, too, to have been much overrated—at least, I have not yet seen an instance of this unfortunate accident. The water contained in the cavity may be both easily and with very general safety drawn off by a lancet or trocar armed with a canula; and it is amazing what quantities of fluid may be thus accumulated. Four to seven, and even eight gallons, have been often met with. Stoerck mentions a single collection of twelve and a half gallons. But the most extraordinary case on record, is one which is detailed in the inaugural thesis of Dr. Caughman, of Lexington, who graduated here in 1835. He relates the case of a young female patient, from whom, at one tapping, twenty-one gallons of water were taken. It was, with good judgment, drawn off slowly, for fear of the evil effects of the sudden abstraction of such an immense quantity, occupying between three and four hours, with occasional intervals of fifteen minutes. In a few days after, six gallons more were drawn off, and, in three weeks after, four gallons, (thirty-one gallons in all.) She died a little while subsequently to the third operation.

The evacuated fluid differs very much in appearance and qualities. It is frequently limpid—generally has a light straw color—is sometimes greenish, brown, thick, sanious, fœtid, etc. Any of these unpleasant variations in its character, are regarded as affording reasons for an unfavorable prognostic. Many patients have lived to undergo the operation repeatedly, for numbers of years in succession, the disease continuing, but its fatal tendencies being counteracted, by thus affording mechanically an artificial outlet for the effusion to which it tenaciously gave rise. I have heard of a patient, who, for thirteen years, was under the necessity of seeking relief in this way; and a case is related in the Edinburgh medical communications, in which the operation was repeated ninety-eight times in the course of three years.

There are several instances in the books, of spontaneous rupture of the umbilicus, with complete discharge of the water

through this opening ; and Good gives us, from Paullini, a story of a dropsical subject, who, refusing to submit to the trocar, "had the good luck to be gored in the belly by a bull," which wound effected the evacuation of the fluid and his recovery.

After the collection is drawn off, a bandage should, in every instance, be brought firmly round the body, to prevent the faintness and sinking consequent on the abstraction of what has been coarsely enough called "the stimulus of distention." The symptoms probably result from the sudden entrance of a considerable amount of blood into vessels from which the due circulation had been expelled by the previous pressure, thus deriving from the brain and heart a portion of their accustomed quantity, greater than they can spare, unless in some measure sustained. For this reason, it is usually proper to offer the patient, when the operation is near its end, some moderate stimulant.

But the good effect of the bandage, does not seem to be limited to this transient service. We have, on respectable French authority, that of Husson, an instance of complete and permanent cure of ascites, effected by pressure applied in this way. "Under the influence of this measure," he says, "the urinary secretion increased, the volume of the abdomen diminished, and all sense of fluctuation soon disappeared." This method of treatment, however, did not originate with Husson. The old English physician, Mead, used to keep up a steady pressure upon the abdomen after each tapping, and he relates two strongly marked cures thus obtained.

In attempting to imitate this successful management, we must take care to put on the bandages as closely as they can be borne by the patient, and to keep them constantly and equably applied in this way.

The drinks and diet in ascites should be nutritious, or even moderately stimulant. During convalescence, much stress must be laid on exercise, and sedentary occupations altogether abandoned. Without muscular exercise in the open air, all efforts to prevent a return of the disease, will be absolutely fruitless. If the means of the patient permit, a long journey on horseback in preference—or a sea voyage, must be undertaken.

CHAPTER XIX.

HYDROTHORAX—DROPSY OF THE CHEST.

UNDER this title, I shall comprise all the collections of serous fluid occurring within the cavities of the chest, whether within the sac of the pleura, hydro-pleura—or within the investing membrane of the heart, hydro-pericardium—or the cellular infiltration of the lungs themselves, anasarca pulmonum.

There has been much dispute as to the nature of these serous accumulations. It is easy to employ such language as shall prevent confusion. Effusions entirely local, occurring as the result of previous inflammation in the part, and subsequent organic lesion, I would refuse to consider as properly dropsical. On the other hand, if the thoracic collection were coincident with collections elsewhere, with anasarca or ascites, no matter though consecutive upon previous disease, I would regard it as idiopathic, because built upon the hydropic diathesis, an essential character of the history of true dropsy. The difficulty seems to lie in the promiscuous use of the phrases consecutive and symptomatic. But the dropsies which follow certain hepatic affections, and some forms of anemia, are at the same time consecutive and idiopathic. No matter in what mode the constituent predisposition may arise, its full development into the peculiar diathesis constitutes the disease; while, on the other hand, no matter how large an effusion may occur from a local morbid action, dropsy cannot properly be said to exist, unless a special morbid state of constitution be generated.

Hydrothorax is more apt to occur after the middle term of life, and in subjects whose constitutions have been broken down by intemperance or by previous ill-health. There is paleness of the face, with some lividity of the lips—dyspnœa augmented upon the slightest muscular exertion—the patient pants much, and is distressed with a sense of oppression and constriction of the chest, on mounting a stair; these symptoms are aggravated, as the case progresses, into orthopnœa, which adds infinitely to his sufferings, by preventing him from seeking repose in a

recumbent posture ; and this inability to lie down, is, in almost every instance, much more urgent on the approach of night. There is usually some cough, with a slight mucous expectoration. Anasarca soon appears, and sometimes, though by no means as frequent an attendant, ascites also. The general health is, in the meanwhile, much impaired—the appetite diminishes—there is often nausea, with vomiting, in the mornings—the strength decays—the pulse is voluminous and perhaps hard, is frequently intermittent, with or without palpitation and a sense of impending suffocation—there is languor with drowsiness—the urine is scanty and high colored—the bowels irregular, often costive—the skin relaxed and cold. In the advanced stages of the attack, one side of the thorax may be found fuller than the other, and observed to move less in respiration.

The Diagnosis of dropsy of the chest, is often difficult and obscure, whether we refer to the special locality of the effusion, or the distinctions which separate it from other diseases. Its symptoms are often counterfeited by other affections, such as asthma, empyema, angina pectoris, chronic pleurisy, certain diseases of the lungs themselves, organic lesions of the heart, and aneurism of the large vessels near it. “So remote from certainty,” says Blackall. “are the diagnostics of hydrothorax, that in one in whom all except the sense of fluctuation were combined, a pulse in every way irregular, palpitations, cough, dyspnœa, inability to remain in bed a single instant, suffocation and deliquia, after sleeping even in his chair, with an anxious, embarrassed countenance, the whole injury was found, on dissection, to be seated in the body of the lung, and in the lymphatic glands at its root.” We shall not often err, however, I think, if we pay proper attention to the symptoms belonging to the history of dropsy. If these, whether in greater or less degree, are conjoined with dyspnœa, notably increased on taking exercise, orthopnœa which undergoes special aggravation at night, threatened suffocation and faintness, not only on attempting to lie down, but whenever the disposition to sleep is yielded to, palpitations of the heart, and frequent intermissions of the pulse, the nature of the case is sufficiently clear. If to these, we add a fullness, perceptibly greater on one side than the other, we attain

a reasonable certainty. When the chest is distended with fluid, the respiratory murmur will no longer be heard, or be very indistinct, and percussion will detect the absence of resonance. If the conditions of particular parts vary in this respect, with the changes of the position of the trunk of the patient, we pronounce the effusion to be within the pleura. If the loss of respiratory murmur, and dullness of resonance are confined, in all positions, to the lower portion of the left side, and the sounds of the heart be indistinct, and the ribs pressed out, we infer the presence of hydrops pericardii. Anasarca pulmonum is known by its coincidence with general anasarca, and the diffused dullness on percussion, and unchanging impediment to the respiratory sounds.

Bichat proposes as a test, to apply pressure upon the abdomen, which, he says, will be found very much to increase the sense of suffocation. Some dwell upon the occurrence of a fluctuation within, perceptible, it is stated, to both patient and physician. I would depend on neither of these. Fluctuation is always obscure, and sometimes cannot be detected in well marked cases. Marshall Hall proposes, in doubtful conditions, "puncturing the chest with a small flat trocar." We may "make assurance doubly sure" by this measure, when paracentesis is indicated and has been determined on; but under any other circumstances, I do not think we should be justified in adding the risk of a penetrating wound of the cavity, to the other evils already urgent enough.

The general Prognosis in hydrothorax proper, is unfavorable. In particular cases, we must be influenced by the age, condition and habits of the subject. However much relieved, it is apt to return, when, of course, the prospects of ultimate cure become darker and less hopeful.

Autopsy. The appearances, on examination, of bodies dead of hydrothorax, vary with the previous history of each case, and with the special locality affected. The investing membranes, the heart and the lungs, are found affected in different modes. The pleura is sometimes thickened, sometimes roughened with flakes of adhesive lymph, sometimes unchanged. These varied appearances of the pleura are sometimes so remarkable, that they

have given occasion to Laennec to say, "that there are cases where the distinction is difficult, even in the dead body, between hydrothorax and chronic pleurisy."

It is an interesting question, whether the changes in the conditions of the heart, so often met with in dropsies of the chest, are the causes or the effects of the disease. I have most often found the organ enlarged and softened. Where any considerable amount of fluid is contained in the pericardium, this membrane, says Copeland, is not reddened or injected; it is somewhat paler or whiter than natural; but it is generally opaque and slightly thickened.

There has been much dispute as to the normal quantity of fluid contained within the pericardium, and the point of increase at which dropsical accumulation can be said properly to commence. Hoffman and Senac deny the presence of any fluid about the heart in a state of health; but a majority of physiologists, including Vesalius, Hallen, Corvisart, Bertin, think that there is a small quantity. Corvisart, generally followed, believes that when this is augmented to six or seven ounces, we shall have the symptoms of hydro-pericardium. Laennec doubts the clearness of our diagnosis, even with twice or thrice that amount.

When the lung has not been previously inflamed and hepatised, or otherwise changed in structure, it is apt to yield to the pressure of the fluid contained in its investing membrane, and become condensed and very much contracted in dimension. Dr. Baillie has seen "the lung, from this cause, compressed to the size of a closed fist." I once met with a similar instance, in which it presented a solid, but not hard or heavy, mass, even smaller than a man's hand; the cavity of the thorax on that side being occupied with a great quantity of fluid and a heart much enlarged and softened.

In what is called *anasarca pulmonum*, the respiratory cells, which receive air from the bronchi, are compressed or closed by the fluid, infiltrated among the loose tissue of which these organs are composed.

The causes of hydrothorax are those of dropsy in general, determined to more direct and primary action upon the chest, by predisposition generated by former or existing disease. Long

continued bronchitis and asthma are accused of aiding in this way specially to produce it.

The Treatment of this form of dropsy differs little from what has been already detailed, in speaking of anasarca and ascites. The modifications required, may be briefly expressed, as consisting in a freer use of the lancet ; less dependence on cathartics ; a greater confidence in the class of diuretics, so called ; and a more urgent necessity for the employment of opium. Venæsection is very much trusted to by many very respectable practitioners, who regard it not only as the quickest means of relief from suffering, but as the most indispensable remedy. Where there is any degree of pain in the chest, and tension across it complained of, or where the strength and pulse are tolerably good, while the dyspnœa is urgent, I would open a vein. Let your patient sit erect during the operation ; let the orifice be large, and let the blood flow until some obvious effect results. Repeat the venæsection unhesitatingly and within a few hours, if the same demand for it become again urgent. In ordinary entonic cases, occurring in subjects of ordinary vigor, and in the earlier stages, the evacuation is usually well borne, and will then be of decided benefit. Home, we are told, resorted to it in one case seven times in eighteen days, with success. I need not repeat here the usual cautions. In the opposite class of instances ; in old subjects ; atonic cases ; asthenic constitutions ; protracted attacks, you will abstain from it absolutely, or experiment with it very carefully. It is well to be aware that the pulse, in this unmanageable disease, is far from being a safe guide ; even in the most unequivocal states of prostration, it often continues hard, voluminous and incompressible to the last moments of life. We must take into consideration the whole history and all the symptoms collectively.

There has been much dispute concerning the employment of any cathartics in hydrothorax. For my own part, I never hesitate to prescribe the hydragogues formerly spoken of, in recent cases, consecutive upon or connected with febrile or inflammatory states of the system. Calomel may be so combined with the other requisite medicines, as to act sufficiently in this way ; and the alterative influences of the mercurials are peculiarly indicated

on account of the almost universal visceral obstructions, induration and disorder, that present themselves in the subjects of hydrothorax. The super-tartrate of potass has received high encomium for its adaptation here, both as hydragogue and diuretic. Some go so far as to attribute to it an indefinable and specific power in the cure of dropsy. Thus Ferriar, Home and McLean state, that they have succeeded with it when it has occasioned no sensible effect. This latter writer and Milman, both affirm that when it has prevailed, and the patient is relieved of his aqueous accumulations, he is sometimes left so weak and emaciated as to die of mere debility, "without any evident cause." McLean ascribes this to its extreme power of exciting the absorbents. I believe it to be better accounted for, as I suggested before to you, by its effect in weakening the digestive functions, and its direct action as a sedative, in destroying the tone of the stomach.

From ancient times an universal preference among remedies, in the treatment of diseases of the chest, was adjudged due to diuretics, as expressed in the maxim of Baglivi, "*In morbis pectoris ad vias urinæ ducendum est,*" and in none of these maladies has it seemed more natural and reasonable to expect advantage from them, than in the case under discussion. Accordingly, the general practice in thoracic dropsies has consisted of little more, after venæsection has been premised, than a series of experiments with diuretics. Of these, the universal voice, (with a few exceptions,) may be said to be in favor of digitalis. Darwin asserts confidently, that "it empties the water more readily from the thorax and limbs, than from the abdomen; and that it is peculiarly suited to relieve, when the constitution is broken down by debauchery and drunkenness." If this be true, and if Withering and McLean be right, that it is specially useful in cases "of great paleness and laxity of fibre," and in attacks brought on by intemperance, it must surely be deserving of a trial here, where so many of these conditions usually concur. My own opinion of it is favorable also, though I cannot venture to boast of great success with it. I prefer to employ it here, in substance, and in combination with some mercurial and some saline diuretic; carefully avoiding ptyalism, on the one hand, as uselessly annoying and irritating, and on the other, the sudden

supervention of exhaustion, against which we should always be on our guard, when exhibiting these powerful drugs.

The squill has been selected by some physicians, as possessing here a double adaptation, and likely to be serviceable, as well by its expectorant as its diuretic qualities. It is said to alleviate the dry and teasing cough, and act as a good revulsive, by exciting the excretories of the pulmonary mucous surface to an increased discharge. I have known it productive of decided benefit, as well when given alone, in full doses of a strong infusion, as when combined in the same manner with digitalis, with nit: potass, and with calomel or blue pill. Nor have colchicum and tobacco failed to receive from high authority, similar unqualified encomiums. They may be used in turn, and will often do valuable service. In a disease of such obstinacy, and so frequently of long protraction, you will be glad of an extended variety of resources. Your prescriptions become tiresome and disgusting to your patient, or his stomach rejects them, and a change is imperatively called for. Two of the more stimulating diuretics have been employed here, turpentine and cantharides; the latter of which, has been loudly extolled by Prof. N. Smith, of Yale College, who considered it peculiarly well adapted to the cure of dropsies of the chest. He combined it with squill.

The diaphoretics are little used in hydrothorax simply for their sudorific powers. The seneka and ipecacuanha, which are expected to assist in promoting a free discharge of mucus from the air tubes, are sometimes employed, chiefly, however, as expectorants. With similar views, the antimonials are occasionally prescribed; and lobelia has been administered in cases combined with or consequent upon asthma, with advantage.

Opium is one of our most indispensable remedies, although in resorting to it, we are forced to encounter strange prejudices, which, I regret to say, are not exclusively confined to the vulgar, but may be met with in educated physicians also. It is but too common to regard the dyspnœa and orthopnœa of hydrothorax, as the mere mechanical results of the presence of effused fluid within the cavities of the chest. This view of the matter is entirely unsatisfactory. The pressure, to which all the distressing symptoms are thus ascribed, can vary only by change of

position, the quantity of fluid remaining the same from hour to hour. But it is well known that many patients breathe comfortably by day, who suffer greatly as night approaches; and that some who sleep refreshingly by day, are unable to doze at night, without the threat of immediate suffocation and syncope; and that some take rest in a recumbent posture by day, who cannot recline in any degree at night, but are forced to preserve strictly the erect position. Nay, these paroxysms of difficult respiration subside spontaneously, in many cases, with the return of morning, after nights of desperate struggling for air, with all the horrors of impending death. Farther than this, every physician of experience, will testify that he has seen notable relief of this paroxysmal dyspnoea follow the use of the lancet, and occasionally also, the effect of a free and relaxant emetic; in these respects, resembling closely the history of some asthmas. From such facts, I have been led to suppose that the effused fluid acts upon the lung, not merely by its mechanical pressure, but as an irritant, exciting vascular disturbance, on the one hand, and spasmodic constriction, on the other, which modes of derangement follow the laws of periodicity. Thus we account for the relief afforded by venæsection, by emetics and expectorants, and hence we are also led to anticipate benefit from the use of opium. I prescribe it freely and in full doses, both alone and in combination, as may be required. With ipecac, as in the Dover's powder, it will often act like a charm, in relieving the intense distress and miserable anxiety of the patient, and allowing him to find a brief repose from his indescribable sufferings. There are few cases in which this anodyne may not be granted nightly. So far from interfering with the good effect of such other treatment as may be indicated, the use of opium will be found greatly to promote it.

In none of the forms of dropsy will we obtain more prompt and definite advantage from the application of external revulsives. Under the same contingencies which require the lancet, we may deplete topically, by cups to the chest. Dry cupping will be found serviceable, when the strength of the patient will not admit of the loss of blood in this way. Large poultices with mustard, will sometimes give great, though transient solace to the nocturnal dyspnoea. But vesicatories should, in no case,

be neglected. They should be among our earliest remedies, and a succession of them kept acting upon different parts of the thorax. They rarely fail to afford more or less relief, though they are more specially demanded in the instances so frequently presenting themselves, and on which so much stress has been laid by Laennec, where there are combined prominently or obscurely, the symptoms of chronic pleurisy, or other internal inflammation.

Much and warm dispute has arisen concerning the propriety of the operation of paracentesis, as a means of removing the accumulation of fluid effused within the cavities of the thorax. The mechanical evils produced in the present case, by such accumulation, are more urgent than in the instance of ascites, and the opening may be as safely and beneficially made in the thorax, as in the abdomen. Something has been said of the danger of collapse of the lung, from introduction of external air; but this seems to me to be much over-rated. Copeland, who, by the way, is no friend to the operation, affirms, "that if the wound be carefully closed after a deep expiration, the resiliency of the lung and the absorption of the air, will overcome this difficulty." I fully agree with him, however, in the advice to take every precaution to avoid the entrance of air, as "acting unfavorably upon the inflamed or otherwise diseased membrane;" and in the suggestion that it is better to heal the wound as quickly as possible, even if it be probable that tapping may be again demanded. The continental physicians are much more in the habit of drawing off the water, in hydrothoracic cases, than their brethren in England and America, who have, perhaps, carried their reluctance or negligence in this matter, to a culpable extent. Even in hydro-pericardium, it has been performed, and in two cases, by Romero, with success. The mode of performing the operation will be taught you from another chair. Like Cullen, I have seen it but once attempted, and with no very flattering success; yet I feel no hesitation in advising a resort to it in properly selected instances, both from reasoning and the reports in its favor, made by numerous respectable authorities in Italy, Germany and France. From the distended sac of the pleura, quantities of fluid have been evacuated that are almost beyond belief. The frequency of its repetition, has also, in certain cases, been very

great. Good, in his Nosology, has preserved some of these records. Four hundred and twenty-seven pounds are thus said to have been drawn off, within ten months, from one patient; from another, four hundred and ninety-five pints in one year, and from a third, by eighty tappings, in twenty-five years, six thousand six hundred and thirty-one pints. More wonderful than all, we have an Italian account of one hundred and fifty pounds having been evacuated at once. In the Berlin Med. Trans., there is an instance of a cure effected by an accidental wound of the thorax, which gave vent to the fluid collected in the pleura.

Whether or not we yield our full belief to the statements offered in favor of this operation, we cannot doubt that life has been, in numerous instances, prolonged in a greater or less degree. In the instance of a patient, whom I saw operated upon, I calculated the protraction of life, though under very unfavorable circumstances, to have been probably about ten days. It was in this case, that the fluid, drawn off, underwent spontaneous coagulation after short exposure to the air.

It is obvious that instances may happen, in which the complications of hydrothorax with other affections, whether of the heart, lungs, or other viscera, will occasion the relief thus obtained, to be both imperfect and of short duration. The little additional life thus procured, will be feeble and comfortless, and held under a precarious tenure. But although our disappointment, in these respects, will cause great regret, yet, I cannot admit that these doubts should influence our practice. No uncertainty as to results, can ever justify a practitioner in failing to follow an indication reasonably made out. And in the case under consideration, there is no great suffering and but little risk involved in the operation, which, as I have already distinctly stated, is only to be undertaken when the mechanical oppression has become intolerable, and threatens to be soon fatal, and when all our remedial measures have been fairly and perseveringly employed in vain. I will add here, a few suggestions from Struve's Asthenology or Art of Preserving Feeble Life. "Those acquainted with the value of life, know the importance of a year, a day, and even an hour. What events, fertile in consequences, depend often upon a single hour? On the bed of death,

an hour may determine the fate of whole families and even states. How many sick die in greater peace, because by having lived an hour longer, they accomplish some one of their most ardent wishes! With what anxiety do many dying fathers wish for such an hour, when they expect the arrival of an absent son! How grateful is it to surviving friends, who have received from a sick man in his last hour, information concerning some important event of his past life."

Perhaps it will always be most prudent to refer the decision of this sad question to the patient, who best knows the intensity of his present distress, and the degree of value he attaches to life on the terms and conditions proposed. It is true that some will shrink from any surgical treatment, even when it is their duty to undergo, and ours to urge a resort to the knife or the trocar. But generally speaking, the reverse is the fact, and we are solicited, such is the instinctive and tenacious love of life, for a delay, a postponement of the last hour, far beyond our ability to accord.

May your death-beds and mine require no such delay; may we find when we approach that awful hour, that every proper arrangement and all requisite preparation have been satisfactorily made, and that we shall have nothing to do but to die. Death will thus be shorn of all his terrors, and we shall sink tranquilly into the grave, the place of refuge and repose, "where the wicked cease from troubling and the weary are at rest."

CHAPTER XX.

HYDROCEPHALUS.—DROPSY OF THE HEAD.

THIS collection of serous fluid within the cranium, may occupy various localities; it is most frequently found in the ventricles, distending them and pressing outwards; it is sometimes poured forth upon the surface of the arachnoid; it has been met with, though not often, between the dura mater and the skull;

it has been said to affect the brain with a sort of anasarca, the cerebral substance itself being infiltrated.

The Pathology of hydrocephalus and its proper nosological position, have been matters of much dispute. It is not commonly associated with the other forms of dropsy. Its occurrence cannot be shown, in the great majority of cases, to depend upon the development of the hydropic diathesis. In a very large class of cases, its connection with the ordinary marks of inflammation is obvious, and in a majority of them, the effusion is apparently the mere result of the vascular action previously highly excited. Finally, its general treatment differs much from that proper in other dropsies, and it is little influenced by the remedial measures usually supposed to be specially adapted to their cure.

I confess, for my own part, the difficulty of replying to these arguments, and the obscurity of the case. Yet, I do not regard them as absolutely conclusive, and have been led to adhere to the ordinary arrangement of hydrocephalus, for the following reasons. Although it is not often found connected with the more familiar varieties of dropsy, or with the hydropic diathesis, yet, it would seem that this is sometimes the fact. Blackall tells us that the urine, just at the commencement of hydrocephalus, is often coagulable by heat, as in other dropsies. He has also witnessed, not only the extension of hydropic diathesis to the head, but also metastasis of the disposition to serous effusions from other parts to the head, both in anasarca and hydrothorax. Something of this latter kind has occurred in my own observation, in four instances, three of them anasarca and one of them general dropsy. That you may have before you the grounds for the inferences I have drawn, I will recite briefly the history of the cases alluded to. The first, a negro girl about nine years, had recovered from the mumps. She was anasarcaous, with perhaps some abdominal effusion also. Though the skin was much distended, and her general health impaired, she was able to sit up, and even to walk languidly about. On a sudden the anasarcaous tumefaction subsided remarkably, in the limbs and trunk, while the swelling of the face and head increased enormously; she complained of blindness, convulsions came on in a few hours, and continued through a night, with

little intermission, the pupils of the eyes being fixed or insensible to light, and the pulse small, chorded and very frequent. She finally recovered. The second, a negro boy, aged ten years, was attacked in November, 1829, with erysipelas of the face, which was followed by œdematous effusion of the eye-lids first, then of the whole head, gradually developing a general anasarca. Having exposed himself very much one day, to a cold north-east wind, the cutaneous swelling suddenly subsided. As night came on, strabismus was noticed to occur, which was soon followed by convulsions, from which he recovered with great difficulty and very slowly. The third instance was very similar in its history. A colored boy of about twelve years of age, convalescent from scarlatina, but anasarcous, having exposed himself during a cold day, was seized at night with strabismus, the left eye being much turned in, while the right side of the body was paralytic and motionless, the swelling having suddenly subsided. His respiration was stertorous. While bleeding him, convulsions came on, and were repeated often and violently; he recovered, but with great difficulty. The fourth, a friend and former pupil of my own, and a graduate of this school, returned hither from the south-west, suffering under dysentery. As he began to improve, ascites showed itself, and the abdominal distension fast increased, with some effusion in the cellular tissue. Prof. Moultrie was in attendance with me. We were surprised on paying him a morning visit to find him nearly free from all dropsical symptoms, and disposed to exult at his prospect of quick restoration to health. Shortly after, within an hour or two, he was observed to be drowsy; strabismus was noticed; then followed stupor, coma, and convulsions, so violent and long protracted as to threaten his immediate death. From this condition he, however, at last emerged; his convalescence being tedious, but ultimately complete.

Andral gives two cases of serous effusion into the ventricles of the brain, in adults laboring under dropsy of the cavities.

In reference to the alleged connection between inflammation of the brain and its membranes, and hydrocephalus, I would observe, first, that it does not seem to me to be uniform or invariable. Congenital dropsy of the head is not very rare, and seems to be the result of some local morbid action, distinct from

inflammation, none of the usual effects of which condition are noted, on examination after death. The same is true of the form, which, occurring in early infancy, is called chronic hydrocephalus, or cephalic dropsy. In many examples of this kind, there is no proof of the existence of inflammation, either in the history of the symptoms, or the appearances on dissection. But secondly, allowing what I am not disposed to deny, that in a great majority of well marked cases of hydrocephalus, the tokens of inflammation are, in the early stages, too distinct to admit of any reasonable doubt; still, it does not follow that the effusion is a mere result of inflammation; it would only tend to establish the doctrine maintained by Coindet and others, that the disease consists in a peculiar modification of inflammatory action, of which effusion is an essential or constituent part. I have, more than once, alluded to the probability that dropsies are connected with some degree of local excitement in the surface affected, and may quote here, as much in point, some observations of Laennec, who, of all pathologists, was probably most familiar with the changes of disease, as shown in the dead body. It is affirmed of him that he had made no less than five thousand autopsies. "Whatever may be the difference between a dropsy and an inflammation, there can be no doubt that these affections, so opposite in their extreme degrees, are nevertheless often very nearly allied in their slighter shades." And, again, after noticing in his dissections of Dropsy, "his having met, not uncommonly, with some spots inflamed in the first, and even the second degree, the inflammatory affection gradually shading into the merely œdematous condition of the surrounding parts. Facts of this kind," he goes on to say, "point to the great affinity between inflammation and the dropsical diathesis." I shall only add, that the effusions within the cranium are similar to those met with in other dropsies, and that in a disease fatal, confessedly, in so large a proportion of cases, no positive inferences as to the Pathology, can fairly be drawn from the Therapeutic. There are not wanting, indeed, physicians who apply, in the management of hydrocephalus, the usual remedies for hydrothorax, etc.

Serous apoplexy has been supposed to constitute a form of hydrocephalus modified by its occurrence in the adult. Cullen ar-

ranges the disease, of which we are treating, as a variety of apoplexy, under the title of *apoplexia hydrocephalica*, and this view seems to be countenanced by Copeland, Göelis and perhaps Andral ; but I do not apprehend any danger of your confounding the two affections.

Hydrocephalus is almost peculiar to young children, being rarely met with after the age of eight or ten years ; and not commonly beyond the third or fourth. It assumes very obviously two forms, which require very different descriptions. Acute hydrocephalus, of which I shall first speak, is usually divided into stages, presenting, in its access or invasion, a series of symptoms, so varied and uncertain, that they have been well regarded as precursory rather than essential. In some children, a train of gastric and intestinal disturbances precede ; in others, a well marked phrenitis ; others again, show the tokens of cerebral congestion ; and it is not rare to see an attack of fever, of ordinary appearance, continued for days previous to any striking symptom of determination to the brain. Under my own care, the derangement of the digestive system has almost uniformly claimed primary and prominent attention. The child is languid and fretful. Its appetite is uncertain, with occasional nausea, foul tongue and fœtid breath. The belly is tense ; the bowels irregular ; sometimes costive, but more frequently irritated into diarrhœa. The pulse is quick and chorded ; the skin, hot and dry ; the urine, scanty. There is febrile excitement, more notable at night, with restlessness and thirst. The face is flushed and turgid, and the hands are often raised to the head, with moaning and sometimes loud screams. When the child sleeps, he grinds his teeth and starts much.

These symptoms having continued unrelieved for an indefinite period, a few days perhaps, those of what I would call the second stage, begin to be developed. Periods of drowsiness now alternate with the restlessness ; the child seems to be in more constant pain, which, it refers by its motions more distinctly to the head ; the pulse becomes slower and fuller ; the pupils of the eyes are fixed, sometimes contracted, but as often dilated ; strabismus ensues ; and the third stage is ushered in with all the peculiar and characteristic marks of cerebral effusion. The pulse is now irregular and rather weak, though it is still apt to retain

the fullness of its volume ; a certain degree of insensibility to external impressions is noted, which becomes more and more marked ; somnolency increases into stupor or lethargy, but I have seldom observed either the coma or paralysis, which some writers describe as common. The head is more perceptibly enlarged ; the imperfect ossification of the skull permitting, the sutures open wide, and the bones separate from each other ; they sometimes become attenuated, and indeed have been seen perforated by absorption of the earth of which they are partly composed. The face is pale and shrunken, and the overshadowing forehead, dilated pupil and introverted eye, give a strange and repulsive expression to the countenance. Respiration is quick and embarrassed ; deglutition becomes difficult ; the pulse fails more and more, and the little patient sinks, from a restless stupor, with or without convulsions, into death.

Chronic hydrocephalus, or that form which is without notable fever or well defined inflammatory determination to the head, is extremely obscure, both in its origin and cause. Like the congenital variety in its history and the appearances presented on examination, it chiefly occurs during the first few months of infancy. We are usually told that the subjects of it, have been weakly children ; but, for the most part, little notice is taken of any special ailment until the enlargement of the head and the openness of the sutures attract attention. The patient cries and sucks feebly ; the pulse is small and compressible ; there is emaciation ; the pupil is dilated and insensible to light ; the muscular debility is such that the child lies prostrate and moans when moved ; its only spontaneous action seems to be the throwing of the head from side to side, as it rests on its pillow, and perhaps pressing and rubbing it with its hands. Diarrhœa, convulsions, and difficulty of respiration soon terminate in death.

As would be reasonably expected from the nature of the organ subjected to injury, the brain, we find a great diversity of anomalous circumstances presenting themselves in different instances. To give you one or two examples of this sort, will be the best mode of illustration. A negro child, fifteen months old, was brought to me with a very remarkable enlargement of the head, the sutures of which were wide apart and distended with fluid. The limbs of this patient were obstinately rigid and ex-

tended stiffly. The legs were stretched out and crossed at the instep, the toe being turned in. Its hands were clenched and its arm was never bent. It had been ill, I was told, about eight months, during which time, its general health was unimpaired. There was no strabismus; its appetite was good; its bowels regular; it breathed well and nursed heartily; it was cheerful and lively; indeed laughed more than most children, and was more easily amused. After some weeks this patient evidently lost ground; there was restlessness and febrile excitement; the bowels became irregular with ulceration of the mouth and tongue; and thus it continued for a year longer, when it was removed from me, and I lost sight of it altogether.

I was called to see, in 1829, a female child between three and four years old, who had been attacked with convulsions. There was loud and frequent screaming and strabismus, and her hands were often lifted to and pressed upon her head. The convulsive muscular contractions were almost exclusively confined to one side or the other, and, strange to say, alternated apparently with a similarly transient paralysis, these contrasted affections shifting repeatedly from left to right, and vice versa. These symptoms continued with little alleviation for three weeks, when she began to convalesce and recovered slowly but quite perfectly.

It is not always that this terrible disease proves fatal, even when it has progressed into the second stage with obvious accumulation of fluid, and great enlargement of the head. Dr. Donald Monro relates the case of a child who was brought into St. Georges' Hospital, with a head much enlarged. The distention continued to increase; the fever and stupor, which had at first attended, gradually subsiding, and at last ceasing entirely. The head still grew, however, so that when the child who was one year and a half old on entering the hospital, had attained her eighth year, it measured two feet four inches round. Her intellect was as usual, and she had a peculiarly retentive memory. It was long before she could walk or preserve her balance, but she at last acquired the power. Many such records may be found in your books.

Dr. W. M. Lee has detailed a similar instance.—“L. R. C., of Abbeville, S. C., has been hydrocephalic from his birth,” having now attained “mature age. His figure inclines to corpulency,

probably owing to his sedentary habits. His countenance mild and placid, by no means indicated mental imbecility ; his complexion is pale and leuco-phlegmatic ; his eyes were not remarkable—there was certainly no strabismus and very little dilatation of pupils. The admeasurement of the head gave twenty-eight and a half inches horizontal circumference, and nineteen and a half from one meatus auditorius to the other, and, in consequence of its sensible weight, he was compelled to keep an exact perpendicular position to avoid falling, or a recumbent posture. He has never walked, but trundles himself from room to room, in a chair fixed on rollers. His stature is probably five feet six or seven inches. His appetite, and general health, are as good as those of most persons of equally inactive habits. His ideas in conversation were clear, and his replies prompt and correct. Until within a short time, his only amusements have been the conversation of the family and the pleasures of the table ; but of late, he has been taught to knit, which now constitutes his principal employment.”

To the kindness of Dr. McKellar, I am indebted for the following very interesting case. The patient “was born in Abbeville district, S. C., a perfect and healthy child, though the cranial sutures were observed to be rather wider than usual. About the second month, his head began to enlarge very visibly ; he became very ill, and lingered several months in an almost hopeless condition. Finally recovering, complete ossification of the cranium took place, his head being twice as large as ordinary at the same age. He walked nearly as early as common children, and enjoyed entire health, sprightliness, vivacity and intellect, with a peculiar taste for music. Sent to school at seven years of age, he exhibited a capacity to learn equal to the majority of his schoolmates, attaining, as he grew up, a considerable knowledge of the Latin and Greek languages. He was disposed to join in all the sports of boyhood, though the weight of his head was so great, as to throw him over, on his receiving the least jostle. He was quite active and strong, his form good, and his features regular and intelligent, but he seemed to be somewhat deficient in judgment in regard to business transactions. At maturity, his head was about thirty-six inches in horizontal circumference. In his twenty-second year,

he was attacked with sudden blindness, which lasted a few hours. This attack was repeated a year or so afterwards. He now became liable to severe paroxysms of pain in the head, occurring every month or two, for several years. These grew more frequent and violent, until, in his twenty-seventh year, he sunk under them."

Dr. G. A. Nott, of Glenn's Spring, S. C., has favored me with a brief account of a singularly impressive instance of similar nature with the above.—"I have under my notice," says Dr. N., "rather an extraordinary case of hydrocephalus, of which I send you the measurements of the head—around the horizontal diameter, $29\frac{1}{2}$ inches; ditto vertical, 31 inches. These, I think, have varied very little in the last seven or eight years. The child is now nearly thirteen years of age—is not larger in the body than one of four or five—*has never walked or spoken*—has but little or no use of its limbs—and, in short, approaches as near to a vegetable existence as any thing we can conceive of in a human form."

Many years ago, a little boy, about one year old, was brought me by his mother, with a request from her medical attendant, that I would examine him. His head had undergone a sudden and very remarkable enlargement, such, that I found it, on measurement, exactly of the size of my own, both in horizontal circumference and transversely. His health was in no mode or degree impaired. The enlargement did not increase, as I from time to time proved by repeated measurements. He went to school in due course, where, as his master informed me, he was inferior to none of his fellows, either mentally or physically, and has grown up stout and active. A few years since, he removed with his parents to the far West, and I know no more of him.

The general Prognosis in hydrocephalus is decidedly unfavorable. I speak now of cases that have advanced so far as to be unequivocally known as such. The first series of symptoms, which I have described as precursory, are by no means to be regarded as announcing a fatal termination; but they may not be connected with, nor do they necessarily tend to, an effusion of serous fluid, in which the disease properly consists as an essential part, at least, of its history. Even after obvious

enlargement of the head, and clearly distinguished accumulation of water within it, we are not, as will be shown hereafter, without hopeful resources, provided there remain any considerable vigor and elasticity of constitution in the little patient. The most unfavorable cases are those which combine great intestinal disorder with febrile irritation and disturbance of the sensorial system, as shown by convulsions, etc.

The Diagnosis of this form of dropsy is very obscure in the first stages, and, indeed, it can hardly be known then, with certainty. We reason, with some probability, from a certain concurrence, just now alluded to, of gastric and cerebral derangement, developed at an age liable, as experience has shown, to this affection. As the disease progresses, the chances of error diminish, until there is no possibility of a mistake. The immense size of the head, whose weight the infant can by no means support, not even for a moment—the strabismus—the dilated and insensible pupil—the distended sutures, often allowing motion of the bones of the cranium and perceptible fluctuation, form a picture too plainly recognized.

Autopsy. The appearances observed after death, will have been clearly enough anticipated, from what has been already said. We are struck at once with the deformity and disproportion of the enormous head, contrasted with the small, shrunken face, and the emaciated body. The mucous digestive membrane is found inflamed and ulcerated very frequently. Some anasarcaous infiltration is generally noticeable. Within the skull is found an accumulation of serous fluid, varying in quantity from ounces to pounds. This is most generally contained within the distended ventricles, the brain being pressed outwards so as to resemble a pulpy sac, the sides of which have been seen by Baillie and Wistar, no thicker than one-eighth of an inch.

Sometimes the effusion takes place between the dura and pia mater. Such was the fact in a case reported by Dr. J. Glover, of this city, in which the brain was absorbed or condensed into a very small compass, being “not much, if any larger than an egg,” and yet, we are told, “the little patient had retained her senses to the last, and appeared to possess many of the faculties of her mind.”

I received the following history of a similar case from Dr. James Yonge, of Fairfield district, S. C.—“The subject was a male infant. It was nursed by its mother, and seemed healthy until it was about two months old. The first symptom noted, was an enlargement of the head—increased arterial action succeeded, and afterwards coma and convulsions. The disease lasted about six weeks. The power of vision was evidently impaired. It seemed to retain the sense of taste, showing an anxiety to take the breast. The upper extremities became insensible. The lower extremities seemed to retain their usual sensibility until death. Examination after death, showed the sagittal and coronal sutures spread something like two inches. I laid open the integuments and dura mater in the course of these sutures, and found the cranium filled with about three pounds of serous fluid, which had been effused between the dura and pia mater. The substance of the brain seemed to have been completely removed. After the fluid drained off, there appeared to be nothing in the cranium but a texture of fibrilli, completely interlocked and wrapt in the pia mater, the whole not being sufficient to cover the base of the skull.” Sir Everard Home has published a case of hydrocephalus, in which the medulla oblongata, and a small medullary pulp behind the orbits, were the only remaining parts of the brain.

I have already mentioned, that the effusion has been found not only within the pia mater and upon the very surface of the brain, but as Gölis affirms, infiltrated within the fibres and interspersed among the cerebral substance. A still rarer locality is that spoken of by Lieutaud—its accumulation between the dura mater and the skull itself. The following case, which occurred under my own notice, appeared to be of this nature, and from its singularity, perhaps, deserves to be detailed to you.

In the winter of 1826–27, the child of a gentleman of this city, being then about ten months old, was somewhat ill with symptoms of rather equivocal disease, the bowels seeming principally affected. While in this state, it fell from the arms of its nurse and received a severe blow upon the head. Whether the cranium was fractured or not, is uncertain; but when I first saw it, some days after its fall, it was easy to perceive a want of a portion of the bone and an opening in the lambdoidal suture,

near its upper angle. The integuments of the head, were here protruded by a fluid, which could readily be pressed back within the cranial cavity, the scalp being distended when it exuded, and wrinkled when it was pressed back. There were no tokens of local inflammation, and the former symptoms of constitutional disease had all subsided as soon as this fluid protuberance was observed. The patient is now a healthy young man, but the depression or hollowing of the skull still remains very obvious. Perhaps it may be proper to add, that no striking effect followed the attempt to keep the fluid within the skull—no stupor, coma or the like. Under a course of active purging, the apparent amount of fluid diminished gradually, and the perforation slowly filled up with bony matter, but never perfectly to the level of the neighboring surface.

The Causes of hydrocephalus, enumerated by authors who have written on the subject, are exceedingly various, and present a lengthened list. Of the predisposing, those which act previously to birth, producing the disease in the fœtus, are of course obscure. Gölis attributes it to terror and anxiety in the mother during the latter months of gestation. Intemperance in either parent is also suggested under this head. Age, we know, gives predisposition. Copeland affirms, that previous to the tenth year, it is most frequent in boys. Cheyne says, that after ten, girls are most subject to it. This writer regards it as peculiarly connected with scrofula. I do not doubt, that the strumous diathesis very strongly predisposes to it, as it often attacks, in succession, several children of scrofulous parents, such cases being almost uniformly fatal. Intellectual precocity, rapid physical development of the brain, as shown by the large size of the head in a child, are said to predispose also to it.

Among the exciting causes, are mentioned intemperance in the mother—the influence of violent emotion in the infant, however aroused—rocking in a cradle—repelled eruptions, especially about the head—dentition—many previous diseases which affect the eucephalon, as pertussis and the exanthemata, and worms. I am disposed to attribute it, in a majority of the cases which occur between five months and five years of age, to some disorder or irritation in the primæ viæ, an opinion which I think finds confirmation and support in the whole history of the acute

form of the disease and its successful management. I do not, however, agree with those who regard it as a mere consecutive affection, dependent, as well as consequent, upon such gastric and intestinal disease. On the contrary, I am satisfied, that the attacks of early infancy and of a period later than the fifth year, are, almost all, instances of primary cerebral derangement, sometimes inflammatory, but often free from any such complication, and exceedingly obscure both in their nature and origin. The older a child is, the better we shall be able to trace its source, and we shall often find it produced by the circumstances that ordinarily occasion determination to the head, cerebral congestion and phrenitis, such as insolation, furious passion, exposure to cold and damp air, metastasis of previous disease, or its extension, as in rheumatism, erysipelas, mumps and other drop-sies, concussions of the brain from whirling, jumping or depending positions of the head.

The Treatment of hydrocephalus must be guided, in each particular instance, by the views which we shall be led, on mature investigation, to entertain of its cause and nature. In an acute case, where febrile symptoms concur with tokens of local inflammatory excitement, the constitution of the patient being of ordinary vigor and elasticity, our resort to the most energetic measures of depletion, must be prompt and decided. When the pulse is full and hard, the face flushed and the temples throbbing, with screaming, pain in the head, and intolerance of light, venæsection should precede our other remedies. Rush, who perhaps carried the use of the lancet as far as can be justified, speaks in the highest terms of its efficacy, and relates several examples of success with it. In urgent cases, especially if convulsions come on, you may open the jugular vein, which gives a more direct and rapid derivation from the cerebral vessels. In general, I have found it as safe and easy to pierce the usual veins in the arm, however.

Cold water, poured in a full stream, at intervals, upon the head, is a very impressive means of relief under these circumstances. I prefer this to the other modes of using cold, either constantly, as by bladders containing ice or iced water, or by evaporation, as in the employment of spirituous lotions. There can be no objection to topical bleeding, by leeches to the tem-

ples, or mastoid processes, or, if they be not at hand, cups to the back of the neck.

Meanwhile, we must not neglect the exhibition of active cathartics. These constitute a most important portion of our resources in the contest with this terrible disease, and truly deserve our confidence. They act favorably, both by reducing the general excitement with which the local affection is complicated, and by deriving most efficiently from the tender organ threatened with lesion. Hydrocephalus is too formidable a malady to be easily subdued by any mode of management, and, in speaking of the Prognosis, I have confessed, that we have little reason to boast of the results of our treatment; but, I am unwilling to abandon the hope of a cure, while the respiration continues unembarrassed, and the patient retains strength to bear the operation of free purgatives. Such recoveries as I have witnessed, are attributable, I think, without exception, to this course. Dr. Rush, after relating several cases of the successful use of the lancet, goes on to say, that he "constantly observed all the patients of whom he had spoken, to be relieved by plentiful and repeated evacuations from the bowels." The obstinate costiveness, which so often exists in the earlier stages of the attack, will render necessary a selection of our most energetic articles, and their administration in as large doses as the stomach will bear, and the plan must be persisted in, not for days, but for weeks together, regulating the effect of our prescriptions by careful attention to the circumstances of the patient. I prefer, at first, a combination of the saline and resinous purgatives, as in the mixture of rhubarb with a solution of Epsom salts; after a while, we may alternate the *ol: ricini*, with an occasional dose of calomel, and the combination of some alkali, potass: soda or magnesia, with *pulv: rhœi*. When jalap does not nauseate or gripe, its efficiency makes it available in some of the formulæ just alluded to, as with potass: or magnesia. Such additions of alkali, while they assist in the production of very large, feculent and serous discharges, which are powerfully revulsive and sedative, prevent the accumulation of irritating secretions in the bowels, and the generation of acid, and thus tend to restore the tone of the digestive organs.

Mercurials have long been fashionable remedies in hydroce-

phalus, and many cures are reported as accomplished by their exclusive employment, internally and externally, mercurial frictions over the head and body, forming a part of the plan followed. Calomel, as I have said, forms a very serviceable combination with our purgatives, but I should be very unwilling to trust to it alone, and I have seen no advantage from such frictions.

Antimonials have been largely used in this disease. Laennec affirms, that he employed the tartrate with great success, administering it in enormous doses. Some of his patients took, as he tells us, five to twenty grains a day. He regarded it as acting in a peculiar and specific manner, powerfully promoting absorption. Very small doses of tart: emetic or of James' powder with opium, adding merc: dulc: pro re nata, have been found of service, when the skin was dry, and febrile irritation present, with vascular action somewhat reduced. Whether as a diaphoretic, or with other views, I know not, but great stress has been laid, by some writers, upon the employment of the vapor bath. Itard is mentioned as boasting that he had cured by it two patients out of three. Dr. Hunter, of York, also eulogizes it.

Diuretics have been exhibited by the German physicians chiefly. In our own country, and England and France, they are little confided in. Dr. Carmichael Smith, so far as I recollect, is the only English physician who gives a favorable report of their adaptation here. He gives the preference to digitalis. Others select the more stimulating, as turpentine, and even cantharides.

Counter-irritation has been greatly relied on by some practitioners. Repeated blisters over the shaved head—to the back of the neck—behind the ears, have sometimes seemed beneficial; but they must not be applied too early. Setons and issues to the neck, shoulders and scalp, are also highly recommended. The caustic issue is strongly urged upon our attention by Dr. C. Smith, who points out the anterior fontinelle as the proper spot to be chosen for it; he keeps it discharging for a long period of time.

Thus far, I have been speaking of acute hydrocephalus, and of its precursory and invading stages. In these alone, will our remedies be found available. When the enlargement of the

head, from serous accumulation within, has become evident, and in the chronic form of the disease—when this distention is the first obvious symptom, we have very little to hope, although we are not permitted absolutely to despair. In these circumstances, our most obvious and pressing indication is to endeavor to preserve or restore the impaired powers of the general system, with a view to excite ultimately the depressed actions of the organ and tissue chiefly affected. The vapor bath, the counter-irritants already spoken of, and the stimulating diuretics mentioned, of which the turpentine and cantharides promise most, extensive frictions with volatile and aromatic substances may be employed, and a nourishing diet administered.

Yet, even in this deplorable condition of things, we are not altogether without resource. The brain yields in young subjects to a prodigious degree of pressure, and retains astonishingly its functional capacities, when its substance appears almost totally lost by absorption or condensation. The head is distended to a monstrous size; the bones separate from each other, and at the wide gaping sutures, fluctuation can be distinctly felt. The fluid may now be drawn off with perfect safety, by passing a lancet or thin trocar through the integuments and membrane. The first successful performance of this paracentesis capitis, is reported by Dr. Vose, whose patient recovered after four tappings. Dr. J. Glover, of this city, has recorded an interesting case in which he drew off from the head of a child congenitally hydrocephalic, six pints and three-quarters of fluid in eight tappings between the seventh and thirteenth months. It is stated, and deserves to be noted by you, that “after each tapping the kidneys uniformly acted more freely for several days, more urine being discharged than at other times, even when diuretics were administered.” This child, whose life was certainly prolonged by the operation, “fell an easy victim to a simultaneous attack of thrush and hooping cough.” Greatwood records the case of a hydrocephalic child fifteen months old, whose head was punctured by its falling on a nail, and the fluid escaping, it perfectly recovered. Dr. Conquest has collected nine successful examples of paracentesis capitis, of which four were cases of his own; he having himself operated on nine patients. It is not proper to withdraw too much of the collected fluid at once; twenty ounces

is the largest amount reported ; nor should the punctures be repeated too frequently. The loose, pendulous bones of the cranium must be carefully sustained by the pressure of strips of adhesive plaster and bandages, properly adapted. Indeed this gentle and continued compression by strips and bandages, seems in chronic cases, of itself, remedial. Barnard and Sir Gilbert Blane, have each recorded a case cured under this treatment; not exclusively employed, however, internal remedies being at the same time administered.

CHAPTER XVI.

SCROFULA.

THE primary local origin of all diseases, is a doctrine so strongly insisted on, and so frequently referred to by a large majority of modern writers on pathology and practice, that it cannot fail to have impressed the mind of every attentive student. Of late, indeed, there seems to me some danger that we shall lose sight of a principle of little less importance,—the dependence, namely, of local affections—diseases implying lesions of peculiar character, as well as functional disturbance of various organs—upon special conditions of the animal constitution, of unlimited and indeed universal influence. There are probably many such vitiations of the general system, predisposing to and productive of local maladies ; as examples it will suffice to refer you to gout, cancer and scrofula, the latter of which I now proceed to make the subject of a brief and comprehensive essay.

When developed, under the agency of whatever circumstances, Scrofula may attack every organ and tissue of the body. The skin, the glands, the bones and joints, the mucous membrane, the eyes, the lungs,—nay, the very heart itself, have been found altered in structure. The lesions which we ascribe to scrofulous predisposition, vary somewhat in the several parts affected, but we infer with sufficient clearness their dependence

upon a common source. This morbid state of the system—somewhat obscure in its nature, and not easily definable—we speak of technically, as “occult scrofula;” the scrofulous or strumous diathesis. The liability of the several organs and tissues to scrofulous affections, seems in some degree to depend upon age; thus, in infancy and early childhood, we have a singular irritability of the skin and eyes, and great frequency of cutaneous inflammation and ophthalmia; next, we have inflammation of the bones and joints, white swellings and morbus coxarius, or glandular enlargements and indurations, and lastly, phthisis, pulmonary consumption in its worst form. It is to be noted that some subjects go successively through all these ailments, and again, that in many families, especially when the parents have been affected with any of these forms of scrofula, some of the children will exhibit one, and others a different local malady of the series above enumerated. I do not hesitate farther to state, that in all such families, and in obvious connection with the class of disorders indicated, we shall find a remarkable liability to the production of what is called tubercle, and the deposition of tuberculous matter.

There is, in the whole circle of pathological discussions, no topic so deeply obscure as the doctrine of predisposition, which involves, as perhaps its most obscure division, the history of latent periods. The hereditary transmission of inevitable tendencies to special disease, is too clearly obvious to admit of a doubt; gout, which does not necessarily imply, even in those who have been repeatedly attacked by it, any notable change in the structure or arrangement of any part, is transmitted only in the latent tendency; and we may suppose the offspring of a gouty ancestor to be in precisely the same condition in which his parent would be found during the intervals between his paroxysms of podagra. Thus also it is with those who are destined to suffer like their progenitors from carcinoma. In scrofula, though the familiar mode of transmission is by means of this inscrutable latent condition, yet there are many cases on authentic record, in which the local affections enumerated under the general head were developed at or before birth.

“A woman died of consumption in the last month of her pregnancy. Her body was examined after death, as well as that

of the fœtus. Her lungs were found full of tubercles, some of which had suppurated, and destroyed much of their substance. The lungs of the child were also studded with similar tubercles, some of which had suppurated."

"Another woman died of consumption a fortnight after being delivered of a still born child. Upon examining the lungs, they were found, as in the preceding instance, studded with tubercles, some of which had occasioned abscesses in their substance. The lungs of the child were in the very same condition, and the kidneys also presented scrofulous tubercles." The morbid preparations referred to in these histories, are to be seen in Mr. Langstaff's Museum, London.

The nature of occult scrofula—this latent but strong predisposition to known forms of local disease, various in seat and in modes of developement, is subject of very unsettled dispute. A majority of recent writers are disposed to regard the strumous diathesis as essentially connected with, if not dependent upon a certain depraved state of the digestive organs. Of the truth of the assumption, I am however very doubtful: I see daily, cases of scrofula of great diversity, where the subjects are totally unconscious of any obstacle or imperfection in the functions of the stomach and bowels.

That the actions of the nutritive or assimilative vessels are impaired, is, on the other hand, very evident. It is probable that the original germ is often ill developed. Thus, besides the diseased appearances above described, the infants of scrofulous parents are often born hydrocephalic, or fall into hydrocephalus soon after birth, or become subjects of rickets or marasmus. The causes which give rise to this peculiar state of constitution, seem calculated, indeed, to affect the assimilative function specially, though perhaps not exclusively. John Hunter attributes scrofula to "dampness and cold alternating with heat, and any agents which debilitate the system;" and adds, "that it prevails chiefly in latitudes above forty-five degrees." Parr declares roundly, that "it is not only hereditary, but in low, damp situations, endemic." Mr. Lloyd considers "the simple or combined operation of cold and variable temperature, with excessive humidity and impurity of the air," as capable of originating a scrofulous state of the system. All agree in ascribing its pro-

duction to the impure air of crowded manufactories; residence in narrow, ill ventilated lanes, low, damp houses—such as the hovels of the poor in large cities; a foul, neglected state of the skin and the clothing; imperfect shelter from the changes of atmosphere; innutritious, indigestible, insufficient diet; intemperance, indolence—which all tend to lower the degree of animal vigor, and deteriorate the physical condition of those subject to their influence.

Children of parents existing under these circumstances, must be endowed with an inferior kind of vitality, and must be born diseased, or liable to the easy invasion of disease; and experience and observation have shown, that certain modes and characters of morbid affection are peculiarly or inevitably apt to develop themselves. That these have a common cause in the ancestral condition of constitution, is farther shown by their occurrence in several children of the same parents, if not in all; and in their passing down, tenaciously transmitted, even after the original causes above enumerated, may for some generations have ceased to act, or their influences have been notably counteracted. That they are also linked together proximately by similarity or morbid identity, we infer, somewhat less clearly, I confess, from the fact that they occur successively in the same individual, or promiscuously in the several children of the same parents. Thus, we shall see in the family of a scrofulous father or mother, one child suffering from cutaneous affections of a definite character, another with ophthalmia, a third with rickets or marasmus, or dropsy of the head. As the same family advances in age, we shall see white swelling of the knee joint in one, a second deformed with morbus coxarius, and a third with the cervical glands swollen, suppurating and ulcerating into ugly sores, and in process of time the whole generation becoming extinct, from the desolation of tubercular phthisis. These conclusions, I say, are irresistible from the daily repeated coincidence of the facts from which they are adduced, and we may safely and logically regard them as established beyond reasonable dispute.

While scrofula is occult or latent, we have no positive indications from which we can infer the presence of strumous predisposition, or the existence of a morbid state of constitution.

There are, however, certain external marks or physiognomical appearances much dwelt on, as exhibiting the internal tendencies. Thus, a child descended from scrofulous parents will usually present, it is said, a soft, fair, flaccid skin, a blue eye and light hair; the outlines of his figure and his countenance will be rounded, and his upper lip full, tumid, and divided in the centre by a deep fissure. As my own opportunities for observation have been extended, I have been less and less disposed to place confidence in this scrofulous physiognomy, having met with very numerous examples of the disease in subjects of dark complexion, black hair and eyes, and coarse skin.

It is easy to account for the belief in the concurrence of the first set of signs in the case, when we remember that they describe the national or tribal characteristics of the Teutonic or Anglo-Saxon races, from whom we have taken the description, and who, from climate and national occupations and modes of living, have been widely afflicted with scrofula. Great Britain presents as many instances, perhaps, as can be found in all the rest of the world besides; nay, some English writers have gone the extravagant length of declaring their belief, that her population may be said to labor under a universal strumous diathesis, in greater or less degree. No region or nation, however, in the world, is free from it. Among us, its undisputed ravages, especially in the melancholy form of phthisis, are becoming more frequent in every successive generation, and although the negro is by no means free from its attack, the mixed race of mulattoes, exhibit a special liability to it.

I have alluded to its successive developments, as somewhat connected with the age of the subject. Tubercle, of which I will by and bye speak more in detail—tubercular formations may occur at any period during the foetal state, or as late as the sixtieth year of life. There are, however, two dates of particular liability to such depositions. The first, affecting the mesentery and digestive tube, about the period of weaning or change of food; the second, destroying the lungs at the time of early maturity. During the interval, the skin, eyes and glands suffer, and the joints and spongy portions of the bones. Cullen declares, that “scrofula rarely makes its first appearance after the age of puberty;” and I am much inclined to subscribe to the

correctness of the remark; at any rate, if a child had evaded every development of the diathesis so long, I would indulge a strong hope, that with prudence he might escape its influence altogether.

The nature and phenomena of the local changes which thus occur in scrofulous subjects, have been carefully examined and repeatedly described. The cutaneous eruptions which we have so many annoying opportunities of watching, are usually first papular and then become squamous or crusty, invading the roots of the hair and spreading over large surfaces. If one of the papulæ appear upon the adnata, a severe ophthalmia is excited; the cornea is attacked by ulceration, which is not generally deep or destructive, but healing slowly, leaves nebulous spots or total opacity behind it. A herpetic affection of the eyelashes and lids, sometimes engrafts itself very tenaciously upon this state of things, and not unfrequently a scabby inflammation of nose and chin, much resembling sycosis. The cervical glands are liable to enlargement and inflammation, in scrofulous subjects, and indeed, it is this affection which is most familiarly known and recognized as scrofula—kings evil, as it used to be designated. Small, hard tumors are observed on the neck, which at first give no pain, unless when handled, but increasing in size, impede the movements of the head, and may indeed, enlarge so much as to interfere with both respiration and deglutition. The skin above them becomes tense and red, they at last soften, and ulceration gives vent to their contents, which, for the most part, consist of whey-like serum, with shreds or small masses of curdy lymph. I have, however, sometimes seen them discharge the most laudable pus that a surgeon could wish. These ulcers enlarge and form ill conditioned and troublesome sores, with edges of a peculiar dull, red or purplish color, very indolent and difficult to heal. When they do heal, they leave ugly cicatrices, the skin of which is ridged and folded irregularly, and wrinkled, so as to constitute a striking deformity. While some glands thus empty themselves and close up, others in turn swell, inflame and discharge, as above described—the process continuing in some instances, not for weeks and months only, but even for years.

The morbid alteration of these scrofulous glands, has been a

subject of minute inquiry. At first there is a mere thickening of their cellular structure, with an increase of the size and number of their nutrient arteries. A total change at last takes place by slow degrees, in the substance of the gland, which is converted into the curdy fluid spoken of above, or a deposition of new matter of firm consistence takes place, caseous or tubercular.

Scrofulous inflammation does not confine itself to the lymphatic glands of the neck; similar tumors and troublesome abscesses are found in the thyroid, thymus, and parotid, over the sternum, in the ham, the elbow, and the groin. The constitutional irritation becomes serious in degree; hectic fever supervenes, and the patient sinks irrecoverably exhausted and worn out.

When the mesenteric glands become in this way obstructed and indurated, a long train of symptoms follow, which have been variously denoted by different writers, but most familiarly referred to under the head of Marasmus.

Gregory was, I think, the first to recognize the cause with distinctness, and attribute to it the series of effects so often met with. It would be well if we would agree with him, to employ the phrase in a limited sense, to designate this infantile complaint, as consisting in a primary scrofulous affection of the peritoneum and mesentery, with consequent disorder of the alimentary canal in all its extent.

Ayre, under this title, treats confusedly of the remittent fever of children, worm fever, cholera infantum, and even hydrocephalus. Good includes under the appellation, whatever distinct and unconnected affections, presenting as their prominent symptom, great emaciation, innutrition or atrophy.

Some have appropriated to our present topic the qualifying term, *atrophia ablactorum*, because it principally attacks children, about the time they are weaned, or just afterward, appearing to have arisen from change of nutriment. Such change may unquestionably excite or aggravate it, but it is not always to be evaded by keeping a child at the breast; whence we infer that it originates from spontaneous alterations and movements in the system, occurring about this time, as coincident with dentition. It shows itself in an infinite majority of cases, in the children of scrofulous parents; or, where the parents have not

exhibited any specific form of scrofulous disease, under circumstances where they and their offspring are obviously exposed to the influence of the agents formerly spoken of, as fostering the production or development of scrofula.

Marasmus comes on with general languor and paleness of the countenance, the bowels are irregular, often at first costive, but more usually irritated with a varying diarrhœa, from beginning to end, the stools being uncertain both in frequency and appearance. The tongue, at first foul, becomes clean and red, and after a time, sore and apthous, the whole lining membrane of the mouth, indeed, being covered with apthous ulcers, with febrile disorder, thirst, and sometimes vomiting. There is remarkable emaciation, the flesh of the limbs being soft and flabby. The belly increases in size, being tense and tumid, usually tympanic, or resonant on percussion, often, but not always, tender on pressure. The appetite is variable, often voracious, and subject to strange caprice; the skin, if there be fever, is hot and dry—otherwise, clammy and relaxed; not unfrequently giving off an unpleasant odor, and occasionally covered with anomalous eruptions. The respiration is hurried, the breath fœtid, the food passes unchanged, the strength declines, and the poor little patient sinks into the repose of death. The length of time required to effect these changes, differs much in different examples; in some it is astonishingly protracted, when we consider how imperfectly the organs of supply have been performing their indispensable functions.

Dissections show the intestines empty and contracted in some parts, in others filled with thick mucus or dark, ill conditioned secretions; the liver, spleen and pancreas, perhaps, firmer and heavier than usual, the peritoneum roughened and its vessels injected, and the glands of the mesentery enlarged and indurated. I have seen these tumors in young subjects of tender age, attaining a prodigious size, not unfrequently of the bulk of an egg or a man's fist, and one such, little less than a child's head.

When the symptoms above detailed, occur in a child whose parents are of known scrofulous habit, there can be no difficulty in deciding upon the nature of the case. They will sometimes, however, be met with in the offspring of those who have shown no marks of the strumous constitution, yet even here the causes

are usually evident enough. "There is no difficulty," says Good, "in accounting for the atrophy which attacks children who are confined to the filth and suffocating air of a narrow cell, the common habitation of a crowding family, from Sunday morning to Saturday night ; or are pressed into the service of a large manufactory and have become part of its machinery, before they have learned their mother tongue."

Scrofula implies an actual contamination of the fluids of the body ; of the blood, in the first instance, and in due succession, of all the materials, whether fluid or solid, secreted, deposited or otherwise separated from it by the action of the vessels and glands. I state my belief in this doctrine of humoralism, broadly and distinctly, with a total indifference to the sneers of the solidists and sympathists, whether on this or the other side of the Atlantic. The doctrines which these gentlemen, in their zeal for innovation, have proposed to substitute, seem to me by no means free from the difficulties they are meant to evade. The pathology of scrofula, suggested by Carmichael, and adopted warmly by Chapman and others, regards the disease as consisting in a highly disordered condition of the whole apparatus of digestion, assimilation and nutrition, beginning in the stomach and progressing thence to the lymphatics.

But if we allow the truth of these assumptions, how is it possible under such circumstances, that the fluid should escape ultimate vitiation !—how can perfect, healthy, pure and natural blood, be elaborated by the action of organs disturbed, deranged and in a morbid condition, and therefore, necessarily incapable of the proper performance of the functions for which they were destined.

If, then, it be clearly made out, that both solids and fluids are ultimately vitiated and in a morbid condition, the sole question is, as to the primary seat of the disease ; and as we know that scrofulous changes take place in the structure of the embryo, long before birth, we establish clearly, at least in cases thus derived, the priority of claim of the fluids to original vitiation.

Scrofula would seem to extend itself to the lower animals, which thus share in one of the curses of our race. Sauvages has admitted into his nosological system Scrofula Chhalasis, affecting the hog, and S. Farcimen, the horse. In the latter, it

has been ascertained by positive experiment to be propagable by transfusion of blood, from a diseased to a healthy animal, and even from the horse to the ass—facts which we have on the authority of Prof. Coleman, of the Veterinary College.

I have mentioned tubercle as one of the productions of scrofula; it is necessary to give you a brief description of it. The term is employed to denote a roundish body of various bulk, consisting of a grey or dull yellow substance of caseous firmness. It is generally admitted to be unorganized, and to derive its form from the tissue in which it is deposited. Some authors, as well in times long past, as recently, have maintained its separate vitality, considering it a sort of parasitic formation contained in its own proper membrane. Carswell, however, whom I prefer to follow in most of his views on this topic, believes it to be formed in the blood and deposited every where—the mucous tissues being its most frequent seat; its shape, of course, depends upon or is moulded by the structure in which it is deposited. Its consistence also varies, it may be pultaceous merely, or granular, or friable, or firm. It is sometimes arranged concentrically or in lamellæ, but is generally amorphous or irregular, and consists chiefly of albumen, with gelatine and fibrine, in which both the phosphate and carbonate of lime are said to be mixed. There has been much dispute on the subject, as yet, indeed, unsettled, but for my own part, I am led to the conclusion, in which a very large majority of pathologists now coincide, that the presence of tubercle depends upon, and is to be received as proving the existence of a scrofulous condition of the system.

It is important to know whether there are agents which can promptly excite into action the dormant tendencies of the strumous constitution, and arouse mere predisposition into open disease. Many circumstances are affirmed by writers to exert this power. Andral tells us that bronchial inflammation will develop pulmonary tubercle; but this I doubt, in any other than a scrofulous individual. In such a one, I think this result highly probable, though even here, by no means certain; for as far as is yet proved, tubercular deposition seems independent of obvious inflammation. Dyspeptic affections unquestionably serve to bring on strumous disorder in many of the organs. John Hunter affirms the same thing of lues venerea. It is asserted, too of small

pox, and others of the exanthemata, to which list, Stoll has added gout. Certain medicines are accused of similar effects, as mercury, arsenic, iron.

The Treatment of scrofulous affections, on account of the obscurity enveloping the nature and history of the diathesis or constitutional condition upon which they are assumed to depend, has been conducted, for the most part, upon empirical principles, or I should rather say, upon no principles at all. Among the ancient remedies, a long and diversified list, we find recorded as effecting unquestioned cures, the blood of a mouse, lizards, the pressure of a man's hand who has been hanged, and above all the royal touch, whence the familiar name of "King's evil" applied to the more commonly recognized form of scrofula.

The faith formerly reposed in these prescriptions, is not to be wondered at. Age, we have said, determines a change of seat or development of strumous disease, and when the cervical tumors disappear, it is easy to ascribe their removal to the remedy last employed.

Whatever be the value of the pathological speculations which attribute scrofula to digestive derangement, the practice deduced therefrom, is the most reasonable and useful. By keeping up as near as possible to the healthy point, the nutritive functions, it is clear that we shall best oppose, whatever be its nature, the progress of the disease, and preserve the constitution in the state best fitted for the removal and cure of its local manifestations.

It will be convenient to class the remedies employed in the treatment of scrofula, under the separate heads of alteratives and specifics, meaning to comprise within the former all such as are calculated to add to the tone of the organs of digestion, or to counteract morbid impressions in any manner made upon them, and thus improve the condition of the general system—and under the latter, to include such as are alleged to exert a peculiar and special influence over the particular morbid influence supposed to constitute the disease. It is to this second class that it has been customary to look with a hope and confidence, hitherto rewarded by no results of any gratifying import.

Under the first division of alteratives, the mercurials deserve a prominent place. It has already been mentioned that some have accused them of developing and aggravating the disease,

and the imputation is doubtless well founded, if urged against their harsh and irritating effects. The excitement of ptyalism has always seemed to me injurious; but it is easy to avoid this, and to procure, without any notable risk, their beneficial action. If calomel be prescribed, it should be in very minute doses, and carefully watched; but I generally prefer the blue pill or corrosive sublimate. These may be taken in the proper quantities long enough to revolutionize the system, without salivating a patient. I shall hereafter speak more particularly of a combination in which mercury is aided by iodine and potassium. With these formulæ much may be done in favor of the scrofulous patient; but I repeat, we must be careful as to quantity and effect. Calomel should not be given in doses beyond one-fourth to one-half a grain, or repeated in this amount more than once or twice a day. The 1-32 to 1-14 of a grain of the corrosive sublimate, may be taken as often, and this may be long persisted in, for it is very unlikely to occasion ptyalism. Blue pill may be given in any desirable combination in the quantity equivalent to the dose of calomel allowed. Beyond this I would not go.

Here I would next notice the purgative plan of treatment. No course of management has on the whole accomplished more for the scrofulous than this. If the cathartic selected be well adapted to the case, entirely unirritating yet properly efficient, and its use persevered in patiently for a good length of time, we shall rarely fail to derive more or less advantage from it. I prefer, when we can obtain it, and when the subject takes it willingly, and without distress at stomach, pure sea water to every other purgative. Some children take very well the combination of rhubarb with an alkali and aromatic—aniseed and carb: potass, for example—and with undoubted benefit. The sulphate of potass alone, in such doses as to move the bowels gently every day, is found highly applicable. The same is true of sulphur. The purgative mineral waters have in this way gained great repute. Alkalies were of old much used in scrofula, under the belief of the existence of an acid acrimony in the fluids. Whatever becomes of the theory, we may regard their utility as entirely established.

Tonics are to be spoken of in this connection. We may either

exhibit them in combination with the cathartics above enumerated—a plan which I prefer, unless there be present a notable degree of febrile irritation—or we may postpone their administration until they are indicated by symptoms of debility. If the purgatives, however, be well chosen, and employed with prudent caution, we shall find the patient gain strength, flesh and cheerfulness under their use. Dr. Physick, in his lectures, when advocating the purgative plan of treatment for morbus coxarius, used to dwell strongly upon the improvement in all these respects so frequently remarked during this course. Iron and bark are generally selected as the best tonics. The sulphate of quinine and the tinct: ferri acet: æther; are most applicable. The whole list of bitters may be resorted to.

Under this head of general remedies we may include the use of the baths, warm and cold, simple and medicated. We do not lay sufficient stress, it seems to me, upon the valuable influences of the warm baths. They determine to the surface from all oppressed internal organs, in a manner peculiarly salutary, and exert upon the skin a remedial action communicated, whether revulsively or sympathetically, to all the tissues of the body. If nothing more were done by them than the procurement of inevitable and perfect cleanliness of person, they would be invaluable. I am therefore willing to yield to my patient an unrestricted choice of modes and circumstances, if he will obey my advice as to the daily repetition of the bath. “Are not Abana and Pharpar,” said Naaman, the leprous Syrian, “better than all the waters of Israel?”—but being persuaded by his servants to obey the voice of the prophet,—he descended into the waves of Jordan, “washed and became clean.”

The residence and apartment of the patient should be dry and well ventilated. His clothing should be warm and well adapted to the season. He should be guarded against exposure to the vicissitudes of weather, and the changes of atmospheric temperature. His diet should be full, agreeable and nourishing; but stimulants should be avoided.

Under the second division of specific remedies for scrofula, we must again notice the alkalies. The chemical notions of the morbid acrimony supposed to taint the fluids, led to a persevering use of a variety of articles of this class. Burnt sponge

attained great celebrity; shells calcined, hartshorn and other animal matters burnt, were much relied on. It is hard to say whether the more elegant formulæ of the present day are equally serviceable. We know what principles chemistry has extracted from these rude prescriptions, as the salts of potassa, lime, soda, and ammonia; but we know not exactly what she may have left behind. Perhaps the natural combinations of the several constituents of these substances may have been important—perhaps their empyreumatic condition as usually exhibited, may have given them efficacy.

Although the analytical processes by which natural compounds are separated into their ultimate elements, are highly interesting, and promise not only to clear up much of the confusion so long clouding over the specific operation of our drugs, but even to add to the list of our most powerful medicaments, yet, I fear, we are in danger of being seduced by the neatness and apparent clearness of their results, into an excessive simplification of our practical formulæ. To exemplify my meaning, I need only remind you of the discovery of iodine in sponge and other marine productions, anciently in high repute for the cure of scrofula. To the alkali contained in these substances, was ascribed all their efficacy, and, hence, they fell into disuse, the more elegant officinal preparations of soda, potass, etc. being substituted for them.

Combinations of chlorine, with the alkalies and earths, have been highly extolled; the muriates, as they were called, of lime, barytes, and soda, are in best repute. The first named, is proposed by Professor J. Hamilton, of Edinburgh, in his violent tirade against mercury, as a safe substitute (of equal efficacy) for this all-powerful alterative. I have no confidence in it. The chloride of sodium—common salt—is of very doubtful utility when given in its pure state. As mingled with the other ingredients of sea water, the excellence of which, I have already acknowledged as a purgative, its value can scarcely be exaggerated. In a pint of sea water, we find, it is said, about one hundred and eighty grains of this salt, with a small proportion of muriate of magnesia, some sulph: magnesia and perhaps of lime. It is to the combination of these, rather than the effect of either singly, that I attribute the unquestioned benefit often

derived by scrofulous patients from the persevering employment of sea water.

Some of the narcotics have been enumerated in the list of specifics, but without any just grounds. Their value as adjuvants cannot be impugned, but they act merely by relieving pain and irritation. I prefer to employ opium, which, as you know, I consider the only certain anodyne in existence—when any contra-indication is opposed to its use, *cicuta*, *hyosciamus* or *lactucarium*, may be substituted.

Last, but not least, among the specific remedies for scrofula, we speak of iodine, already alluded to in a passing remark. This agent—one of the most important offerings which analytical chemistry has ever laid upon the altar of Esculapius—is a simple or elementary substance, found in the sea-plants anciently so much prescribed in the case before us. Its reputation, after some reverses, is at length fairly established; but, in the earlier experiments made with it, so many instances of injurious results were detailed as to point out the necessity of great caution in its employment. In fact, such ill-consequences followed its indiscriminate administration in the region where it was first prescribed, that some of the Swiss cantons laid, by law, stringent restrictions upon its use. The mode of exhibition seems to me to be a point of great importance. As at first given, in substance and in strong alcoholic tincture, Magendie's mode, it is apt to prove irritating, and excite fever and other annoying effects. I have abandoned these formulæ altogether, and confine myself to the simple aqueous solution advocated by Lugol, and necessarily very dilute, as iodine is so sparingly soluble in water, and the new preparation mentioned above, known commonly as the Deutiodide of Mercury and Potassium. This latter, I regard, as a very valuable combination of remedies of special efficacy. Diffusing one grain of iodine in ℥ij. of water, let the patient take a wineglassful thrice a day, or give him as often from 6 to 10 drops of the deutiodide of the shops. Few stomachs will bear more than this, though the journals speak of 25 drops as being often taken. Some perseverance is necessary, if we would derive any benefit from these formulæ. If anything yet known, can occasion or promote the absorption of a tubercular deposit, it is iodine; and almost every other form

of morbid deposite, and every hypertrophy is, more or less, under its influence. I have little fear of its injurious operation, if exhibited as I have recommended; but it may as well be stated, that it seems sometimes to excite fever by a stimulant power, and occasionally produces a good deal of nervous irritation in constitutions of inordinate mobility. In such cases, I would lay it aside.

Its usefulness is not confined to its internal administration; it is much confided in also as a discutient in all scrofulous tumors when rubbed upon or applied to them. "It is almost incredible," says Coster, "how promptly the largest goitres have disappeared under this management;" and though I will not affirm, that it is as constantly favorable in scrofula, yet it is certain, that scrofulous tumors yield sooner to the action of iodine than of any other remedy known.

In regard to the local treatment of these affections, I offer you the following remarks as the result of my own observation and experience. While the cervical tumors are indolent, and of moderate bulk, I would let them alone. They are in this condition evils easily borne, and I am inclined to think, with Parish, that if the strumous diathesis is determined hither spontaneously, we cannot, by any interference, provide it a better location. This is probably revulsive, and may save the lung or some other internal organ or tissue.

When these tumors, however, enlarge without pain or inflammation, as they often do, attaining an inconvenient and distressing size, I would resort to iodine externally as well as internally. If the skin become tense and red, we must desist from the iodine ointment, which is stimulating, and use saturnine lotions and soft poultices.

Leeches are often useful in subduing this inflammatory state of the glands; and the opposite or indolent enlargement may sometimes be benefitted by the application of a blister, which gives efficacy to the iodine ointment. When fluctuation is perceptible, an emollient poultice should be advised, to relieve tension and solicit the approach of the contents to the surface. A small opening should be made early to prevent the formation of a ragged and deforming ulcer, and the lips of the wound kept in apposition to induce its healing.

The treatment of Marasmus, as far as it exhibits itself in the

symptoms of gastric and intestinal disorder, will be found detailed under the head of Cholera Infantum, to the lecture on which, I therefore refer you, with the single additional remark, that some of the practitioners of continental Europe have affirmed that iodine may be used with great advantage in combination with the other remedies indicated. My own trials with it, however, have afforded me no satisfaction. Nor must you forget the peculiar stress, which, in cases complicated with strumous tendencies, it is proper to lay upon personal cleanliness, neatness, and perfect ventilation of the chamber, the choice of an elevated and dry habitation, free exercise, and an abundant supply of nourishing food.

From all that has been said above of the difficulty of controlling the malignant predispositions of the scrofulous diathesis, the universal extent of its dominion when developed over every organ and tissue of the body, and the extreme tenacity and unmanageable obstinacy of the local affections thus arising, you will readily infer the very great importance of the Prophylaxis. As we are aware that diseases, and predispositions to disease, may originate from a continued application or frequent repetition of morbid impressions, so also, we have reason to believe that they may be evaded or escaped, by avoiding the sources of their production when detected; and even the tendency to them, may be gradually worn out by a prolonged avoidance of their exciting or occasional causes, care being taken, at the same time, to counteract, as far as possible, the influence of the morbid impressions which induced the predisposition. To apply these observations to the case before us, scrofula is ascertained to be specially prevalent under certain obvious circumstances, which may, hence, be pointed out definitely as causes favoring the peculiar condition of the system. Like other states of constitution, it is apt to be transmitted from parent to child in the mysterious process of generation.

In some subjects, the state of actual disease is thus transmitted; in others, a proclivity so intense, that it needs no exciting cause, or rather the ordinary habits of life act as efficient causes. In a third class, the strumous diathesis may obviously exist, and yet the subjects of it, shall, in a proportion at least, have the good fortune to pass through life without any development of the lurking evil. We account for this happy exemption, by

supposing that the causes calculated to favor the access of the dreaded malady, have been avoided, whether accidentally or by precaution. Now, it is evident, that a few generations successively continuing to exert this prudence, or to enjoy this good fortune, the constitutional peculiarities would gradually lessen, and finally disappear.

The principal circumstances known to foster scrofulous tendencies in the system, are, 1st. Cold and moist climate ; 2nd. Exposure to atmospheric vicissitudes ; 3rd. The want of fresh and pure air ; 4th. Innutritious diet.

1st. The influence of climate has been already dwelt on, and that of Great Britain, described as so singularly unfriendly, that, in the words of Young, "scarcely an individual native and resident there, can be said to be entirely free from strumous predisposition." Migration is not, however, a remedy in general of easy application, and we must, therefore, for the most part, content ourselves with mitigating, as far as we may, the evil influences which prevail in our native atmosphere.

2. The clothing should be well adapted to defend from chill and dampness. Woollen garments should be worn in winter and cotton in summer ; and by a proper site, elevation, position and mode of building, our habitations should be made to protect us from cold and moisture, while well arranged chimneys supplied with abundant fuel, ventilate fully and warm our apartments.

3d. Fresh and pure air is indispensable to the enjoyment of animal life. Yet this cheapest and most common of the bounties of Providence is almost out of the reach of multitudes of the human race. In the densely populous cities of Europe, how many lanes and alleys, how many dungeon-like hovels and cellars may be pointed out, into which no ray of Heaven's bright sun ever penetrates, into which no breath of morning or evening breeze ever finds its way. Well might the poet exclaim, "God made the country and man made the town !" But even in the country we may meet now and then a nest of these huts—abominable recesses, abodes of discontent, of sickness and of death.

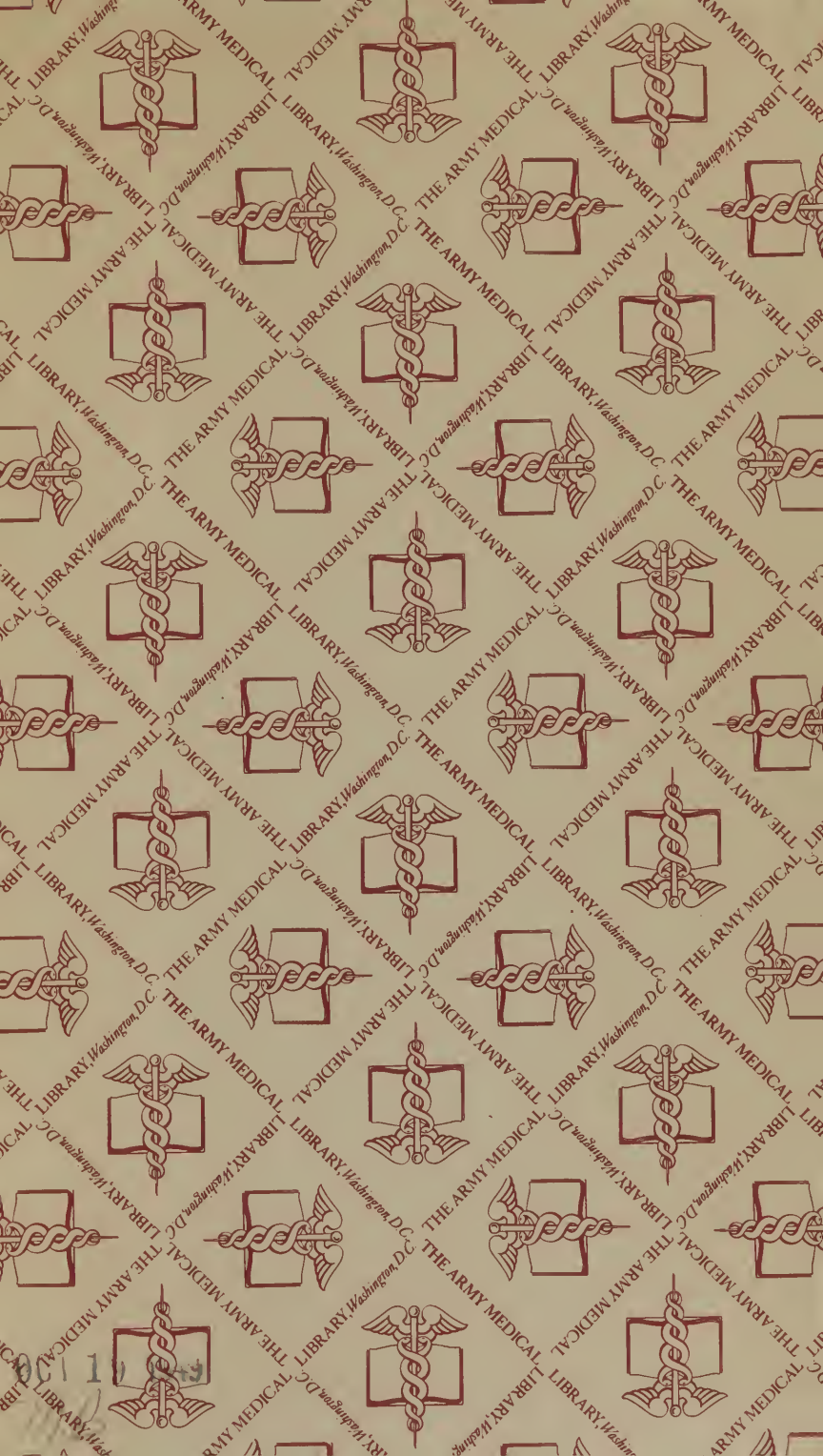
Wherever a manufactory raises its chimneys or rolls its ever moving wheels, a crowded village soon surrounds it. Here find a common centre—poverty and filth. Children of wretched parents soon share their wretched occupations ; and exchange in

the confined and heated rooms where they carry on the toils which at once give them the means of living and rob life of that health which alone makes life a blessing, the plump and rosy lip and ruddy complexion, for the pale sallow hue of languor and disease.

4th. An abundant and nourishing diet is essential to the development of animal vigor. Scanty food, or of innutritive quality, produces degeneracy and disease. Stimulating substances, however, should be avoided, and all intemperance shunned with as much anxiety as the gates of death.

In conclusion, let me once more remind you of the essential importance of cleanliness. There is no means by which we may more surely depress the tone both of mind and body, than by suffering the skin to retain and accumulate its own secretions. Bathing is, indeed, a double tonic, and productive of immeasurable advantage, both by the removal of these excretions, and the spur which it gives to the cutaneous vessels. Invalids will generally profit most by the use of the warm or tepid bath, but where there remain any considerable strength or elasticity, the cold bath, in the proper season, and especially if sea bathing be convenient, will often be found of prompt and obvious service, on account, perhaps, of its greater stimulant action upon the surface. It cannot be requisite that I should go over again what I have so often said in favor of exercise, the great invigorator of the vital powers. A mode of exercise of which I have not yet had occasion to speak, but which I do not on that account, value the less—I allude to swimming—an athletic amusement, which formed the delight of Franklin and of Byron, who both practised and eulogized it, can need no eulogy or recommendation from me. It is peculiarly adapted to our present purpose, as combining muscular exertion with necessary and unavoidable cleanliness. Plunge your patient, then, early into the waves of the sea or the pure waters of the nearest stream, and though you will not render him like the son of Thetis, invulnerable by the immersion, yet you will secure to him a permanent means of comfort and enjoyment, and confer on him the power of rescuing himself and others from a species of danger to which each of us is often liable.





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